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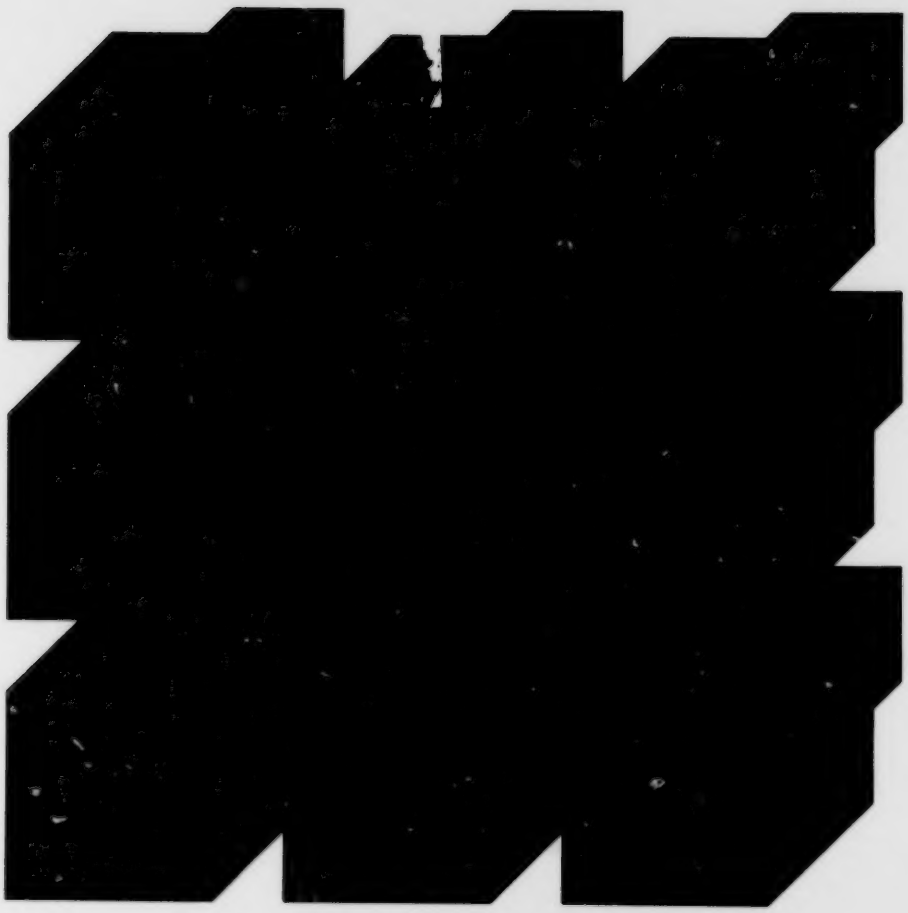

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DISCUSSION PAPER NO. 300

Local Government Enterprise in Canada

by Harry M. Kitchen

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RÉSUMÉ

La plupart des entreprises commerciales appartenant à des gouvernements municipaux sont situées dans la province de l'Ontario. En outre, le plus grand nombre d'entre elles excercent leurs activités dans l'industrie de l'électricité.

Bien que ce document examine brièvement la taille et la croissance relative des entreprises commerciales des gouvernements municipaux au Canada, il procède en tout premier lieu à une évaluation des politiques de fixation des prix, ainsi qu'à une analyse des coûts de trois services particuliers qui sont offerts à cet échelon gouvernemental dans la province de l'Ontario. Il s'agit des services d'aqueduc, de transport urbain et d'électricité.

À la base de cette évaluation, il importe de faire une analyse des effets et de l'importance de la structure organisationnelle tant des prix que des coûts. Dans le cas des services d'aqueduc, ils sont assurés soit par un département municipal, soit par une commission distincte; le transport urbain pour sa part est administré soit par une commission distincte, soit par un département de l'hôtel de ville, ou soit encore au moyen d'un contrat accordé au secteur privé; quant aux services d'électricité, il sont toujours administrés par une commission distincte, mais en certains cas, les commissaires sont élus et, dans d'autres, ils sont nommés (la même règle s'applique aux commissaires des services d'aqueduc).

Même si les résultats de cette étude montrent qu'il existe des variations considérables dans les prix des services municipaux, les structures et les politiques de fixation des prix ne correspondent pas vraiment au type d'organisation habituellement chargé d'assurer les services des gouvernements municipaux. Les politiques de fixation des prix, en effet, semblent avoir été établies en vue de couvrir une proportion pré-établie de tous les coûts d'exploitation. Malheureusement, les prix fixés ne semblent pas prévus en vue de respecter en même temps le principe des coûts marginaux. En dépit des raisons, d'ordre pratique ou autre, pour lesquelles ce principe n'est pas respecté, les gouvernements municipaux - s'ils se donnaient au moins pour objectif d'adhérer le plus étroitement possible à ce principe - pourraient obtenir de nettes améliorations sur le plan de l'efficacité.

Les résultats de la présente étude montrent que, contrairement aux politiques de fixation des prix, la structure organisationnelle comporte des effets importants sur le coût unitaire du

transport urbain. Par exemple, l'enquête empirique permet d'expliquer plus de 70 % de la variation unitaire des dépenses d'exploitation. Plus précisément, on a pu remarquer que les services confiés à contrat au secteur privé (par la municipalité) étaient beaucoup moins coûteux (à un niveau de 0,005) que les services assurés par un organisme public. De même, les services assurés par un département municipal sont beaucoup moins coûteux (à un niveau de 0,15) que ceux d'une commission distincte de services publics. Cette dernière conclusion se rapproche d'ailleurs de celle qui a déjà pu être tirée d'une étude antérieure sur les services d'aqueduc en milieu résidentiel au Canada.

ABSTRACT

Most local government business enterprises are located in the province of Ontario. At the same time, the bulk of these enterprises are concentrated in the electric power industry.

While this paper reviews briefly the relative size and growth of the local government business enterprise sector in Canada, it primarily concentrates on an evaluation of the pricing policies and the costs of providing three specific services in the Province of Ontario. These services include the provision of water, transit and electricity.

Underlying this evaluation is an attempt to assess the effect and importance of the organizational structure on both prices and costs. In the case of water, it is provided through a municipal department or separate commission; transit is operated under a separate commission, or a department at city hall or privately contracted; electricity is always provided through a separate commission but in some instances the commissioners are elected while in other instances, they are appointed, (the same applies to water utility commissioners).

While the results of this study suggest considerable variation in the pricing of urban services, the pricing structures and policies employed cannot be closely identified with the type of organization currently providing local government services. Indeed, the pricing policies appear to have been established to cover a preset proportion of all operating costs. Unfortunately, the prices charged tend not to be set to correspond to the marginal cost pricing principle. Although there may be reasons, practical or otherwise, why this principle is not followed, distinct improvements in efficiency could be achieved if closer adherences to this principle became a local government objective.

By contrast with pricing policies, the results of this study suggest that the organizational structure significantly affects the per unit cost of providing urban transit. For example, the empirical investigation suggests that well over 70 per cent of the per unit variation in urban transit operating expenditures can be explained. More specifically, it is observed that privately contracted service (by the municipality) was significantly less costly than publicly provided service (at the .005 level). As well, provision through a city department is significantly less costly than provision through a separate utility commission (at the .15 level). This latter conclusion has also been reached in an earlier study on residential water provision in Canada.

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1 INTRODUCTION

Local government business enterprise in Canada has developed and grown for various reasons. Historically, the provision of most local services began in the private sector; however, complaints and/or concerns raised by local residents, politicians and the business community created an environment in which the provision of many of these services was assumed by the local public sector. For example, it was alleged that the provision of electricity by private firms led to high prices and hindered industrial and economic development which was so urgently needed. Furthermore, the existence of profits earned by private producers may have encouraged the city's politicians and local officials to share in the economic returns through taking over from private producers, the provision of electricity.[1]

Concern with a number of issues including the necessity of eliminating impure water in order to avoid health hazards; the desire to provide water at the lowest perceived cost so as to foster economic and industrial development; and the requirement of generating sufficient quantities to provide adequate fire protection and lower fire insurance premiums all contributed to the municipal takeover of water provision.[2]

Local transit became a municipal responsibility largely as a result of the local politicians' interest in having more control over municipal planning and development activities. This interest was substantially created through pressure exerted by local real estate developers, business men and citizens to provide services to specific areas in the local community.[3]

While these examples reflect some of the reasons for local government provision of selected services, it must be noted that others exist. Indeed, in each specific community, there were issues which were unique to the growth and development of the local government sector in that community. In fact, this uniqueness has contributed to a wide diversity in both the legal and institutional environment in which these enterprises currently operate. This environment is largely shaped by the imposition of provincial or local involvement either through the use of rules and regulations in the pricing of local services such as water, electricity and gas or through the use of subsidies to offset operating deficits as in the case of urban transit. Each of these constraints is likely to provide incentives for local decision-makers to behave in certain ways. While the availability of individual enterprise data in Canada is restricted almost exclusively to Ontario, these data will be used to test a number of behavioural hypotheses. When these results are combined with predictions from the relevant economic theory, one can derive a

number of implications about the behaviour of decision-makers operating under different organizational structures.

The paper is separated into three major sections. The next section outlines and comments on the universe of local government enterprise in Canada. This is followed by a description and evaluation of the institutional environment within which pricing and, to a much lesser extent, investment decisions are made in the provision of three specific local government enterprise services in Ontario; specifically water, transit and electricity. The third major section tests, empirically, the relevant efficiency of providing these local government services under different organizational structures. Included in this section is (i) a comparison of local government provision versus provision on a contract-basis by a private supplier; and (ii) provision by a separate local government commission versus provision by a department within local government (city hall).

The summary and conclusion of this paper draws from both the theoretical literature and empirical evidence in making suggestions about the implications arising from the various organizational structures which might be adopted. Policy recommendations are made on the assumption that it is part of the local government's mandate to provide local services in the most efficient and effective manner possible.

Notes

1 Artibise, Alan F.J., The Urban Development of Winnipeg, 1874-1914, Ph.D. dissertation, University of British Columbia, 1971, National Library of Canada, Canadian thesis on Microfilm, No. 11201, pp. 125-144; and Armstrong, Christopher and Nelles, H.V., "Contrasting Development of the Hydro-Electric Industry in the Montreal and Toronto Regions, 1900-1930," Journal of Canadian Studies, Vol. 18, No. 1 (Spring 1983), Trent University, Peterborough, Ont., pp. 5-27.

2 Artibise, op. cit., 1971, pp. 297-322; and Jones, Elwood and McCalla, Douglas, "Toronto Waterworks, 1840-77: Continuity and Change in Nineteenth Century Toronto Politics," Canadian Historical Review, September 1979, University of Toronto Press, Toronto, 1979, pp. 300-323.

3 Hatcher, Colin, Stampede City Steetcars, Railfare Enterprises Limited, Montreal, 1975, pp. 8-79.

2 UNIVERSE OF LOCAL GOVERNMENT ENTERPRISE

Introduction

The definition of what constitutes a local government enterprise is neither clearcut nor obvious. Undoubtedly, it consists of those enterprises engaged in the production of marketable goods and services. The most obvious include the sales of electrical power, the distribution of gas, the provision of urban transit services and the ownership of local telephone systems. In fact, it is these four which according to various size measurements (operating expenses, employment and assets) are deemed to constitute about 95 per cent of all local government enterprise activity.[1]

However, depending upon one's definition,[2] there are other services which might be listed. These include local water supply systems which are relatively significant in terms of size especially when compared with gas distribution and telephone systems, municipal airports, local government housing authorities, local government development commissions and many local government boards and commissions, all of which have been created to supervise, organize and/or provide many additional services. Excluding

water supply systems, the sum of these additional enterprises, however, totals less than 5 per cent of all local government business activity.[3]

Of the four major local government business enterprises recorded by Statistics Canada in 1983, Table 2-1 reports them by province and by type of enterprise. Over 76 per cent (382 enterprises) of these four enterprises combined were located in Ontario with less than 10 per cent (48) located in Alberta and the remaining provinces listing much smaller totals. At the same time, almost 76 per cent (378 utilities) were concentrated in the provision of electric power.

Urban transit accounted for almost 15 per cent (72 systems) with gas and telephone following at slightly more than 6 per cent (32 systems) and almost 4 per cent (18 systems) respectively.

Relative Importance of Operating Expenses

Perhaps of more importance than the actual number of local government business enterprises in existence in 1983 is the growth in the relative importance of these enterprises. Table 2-2 reports total operating expenses for each of the four enterprises as a per cent of provincial and local government expenditures combined[4] for the period from 1976 to 1982 (the only time period

Table 2-1

Number of Local Government Business Enterprises Reported in 1983

	Newfound-land	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat-chewan	Alberta	British Columbia & Yukon	Total
Electric Power	-	1	8	3	20	327	1	2	9	7	378
Urban Transit	1	-	2	3	9	37	2	3	8	7	72
Gas Distribution	-	-	-	-	-	2	-	-	30	-	32
Telephone Systems	-	-	-	-	-	16	-	-	1	1	18
Total	1	1	10	6	29	382	3	5	48	15	500

Source Unpublished data from Statistics Canada.

Table 2-2

Total Operating Expenses of Local Government Enterprise as a Per Cent of Provincial Plus Local Government Current Expenditures 1976-82

	1976	1977	1978	1979	1980	1981	1982
Electric Power	3.1	3.6	3.4	3.5	3.6	3.6	3.6
Urban Transit	1.5	1.5	1.5	1.5	1.9	1.6	1.6
Telephone Systems	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gas Distribution	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	4.9	5.4	5.2	5.3	5.8	5.5	5.5

Source Local Government Enterprise expenses were obtained from unpublished data at Statistics Canada, while provincial and local government expenditures figures were calculated from information in Table 3 of Provincial Economic Accounts, 1967-1982, Catalogue Number 13-213 annual, Statistics Canada, Ottawa.

for which data are available). Overall, local enterprise operating expenditures were 4.9 per cent of combined provincial/local government current expenditures in 1976 and 5.5 per cent in 1982. Of this total, the relative importance of gas distribution and telephone systems did not change. Urban transit increased marginally while expenditures on electrical power increased slightly more than corresponding expenditures by provincial and local governments in total.

Realizing that totals for Canada may hide some regional variations, Table 2-3 lists local enterprise operating expenses for electrical power and urban transit (regional data for gas and telephone systems are not available) by region as a per cent of all provincial and local government current expenditures for the corresponding regions. In each instance, local government enterprise is relatively more important in Ontario. Operating expenses for electric power utilities in Ontario amounted to 7.4 per cent of aggregated provincial/local government current expenses in 1976 but increased to 9.2 per cent by 1981 and then fell to 8.9 per cent in 1982. Alberta was the only other province to display any noticeable increase in the relative importance of this sector from 1976 to 1982 (from 3.6 to 5.0 per cent of corresponding government expenditures).

Table 2-3

Total Operating Expenses of Local Electrical Utilities and Urban Transit Systems as a Per Cent of Local and Provincial Government Current Expenses by Region 1976-82

Region	1976		1977		1978		1979		1980		1981		1982	
	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit
Atlantic Region	0.8	0.3	0.9	0.2	0.7	0.2	0.9	0.3	0.8	0.3	0.8	0.3	0.7	0.3
Quebec	0.3	1.9	0.3	1.8	0.1	1.9	0.3	1.8	0.3	3.0	0.3	2.0	0.4	1.8
Ontario	7.4	2.1	8.6	2.0	8.2	2.0	8.7	2.1	9.1	2.1	9.2	2.2	8.9	2.1
Manitoba Saskatchewan	1.5	1.3	1.4	1.2	1.4	1.1	1.4	1.1	1.4	1.1	1.5	1.0	1.3	1.0
Alberta	3.6	1.6	4.2	1.6	4.0	1.8	4.0	1.6	4.0	1.7	4.6	2.1	5.0	2.1
British Columbia & Yukon	0.2	0.0	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
Canada	3.1	1.5	3.6	1.5	3.4	1.5	3.5	1.5	3.6	1.9	3.6	1.6	3.6	1.6

Source Same as Table 2-2.

In the remaining regions and depending on the year observed, expenses on electrical power ranged from 0.1 to 1.5 per cent of provincial and local government current expenditures (Table 2-3).

In total, local urban transit operating expenditures were noticeably smaller than operating expenditures for local electrical power utilities in each year under observation. This trend was also reflected in every region with the exception of Quebec where urban transit expenditures noticeably exceeded the corresponding totals for electrical power.

When urban transit and electrical power expenditures are summed for Ontario, their total operating expenditures rose from 9.5 per cent of provincial/local government current expenditures in 1976 to 11 per cent or more in the 1980s. At the same time, a similar increase, from slightly more than 5 per cent to slightly more than 7 per cent, was noted for Alberta. Local transit and electrical power enterprise in the remaining regions remained constant or decreased in relative importance. In fact, local government enterprise is almost non-existent in British Columbia and relatively unimportant in Atlantic Canada, Quebec, Manitoba and Saskatchewan (see Table 2-3).

The use of operating expenses as a measure of the relative growth in the importance of the local government enterprise sector may not be appropriate if it reflects primarily an increase in the

cost of materials purchased such as energy or fuel, an item which is a significant cost in the provision of local electricity and urban transit services. To overcome this problem, it has been suggested that value added would constitute a more appropriate measure of the relative importance of the local government enterprise sector. However, when value added by local government enterprises (individually and aggregated) was taken as a per cent of combined provincial and local government expenditures (this was chosen as the base for noting the comparative increase since value added figures were not available for all provincial and local government activities), the percentages, although lower in absolute value, reflected the same pattern as illustrated in Tables 2-2 and 2-3; hence, these value added figures are not reported here and the observations made in the preceding few paragraphs still apply.

Relative Importance of Employment

Obviously, one measure by itself (operating expense) cannot be used as a basis for making definitive statements on the relative size of the local government business enterprise sector. Hence, Tables 2-4 and 2-5 have been included to reflect an alternative and different measure of the relative importance of local government enterprise.[5] These tables measure local government enterprise employment, by sector and region, as a per cent of total

Table 2-4

Local Enterprise Employment as a Per Cent of Total Provincial and Local Government Employment 1976-82

	1976	1977	1978	1979	1980	1981	1982
Gas Distribution	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Telephone Systems	0.4*	0.4*	0.4*	0.3	0.3	0.3	0.3
Electric Power	1.9*	1.8*	1.7*	1.3	1.3	1.5	1.5
Urban Transit	5.1*	5.1*	5.2*	4.4	4.5	4.6	4.4
TOTAL	7.4*	7.3*	7.3*	6.0	6.1	6.4	6.2

* Excludes British Columbia.

Source Local Government Enterprise employment figures were obtained from unpublished data at Statistics Canada, while provincial and local government employment figures were obtained from Provincial Government Employment, Oct.-Dec., Quarterly, Catalogue Number 72-007 and Local Government Employment, Oct.-Dec., Quarterly, Catalogue Number 72-009 Statistics Canada, Ottawa.

Table 2-5

Employment in Urban Transit Systems and Local Electrical Utilities as a Per Cent of Provincial and Local Government Employment by Region 1976-82

Region	1976		1977		1978		1979		1980		1981		1982	
	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit	Elec.	Transit
Atlantic Region	0.4	0.9	1.0	0.7	0.4	0.8	0.3	0.8	0.3	0.8	0.3	0.8	0.3	0.6
Quebec	0.3	6.2	0.2	6.4	0.3	6.5	0.2	6.2	0.2	6.5	0.2	7.0	0.2	6.7
Ontario	3.5	6.3	3.3	6.0	3.0	6.2	2.9	6.1	2.8	6.0	2.9	6.1	2.8	5.7
Manitoba Saskatchewan	1.7	4.0	1.7	4.1	1.6	4.1	1.4	3.5	1.4	3.7	1.4	3.6	1.4	3.6
Alberta	2.2	3.5	1.5	3.9	1.6	4.4	1.5	4.0	1.5	4.1	2.0	4.1	2.0	4.2
British Columbia & Yukon	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.1	0.2	0.1	0.3	0.1	0.3	0.2	0.2
Canada	1.9*	5.1*	1.8*	5.1*	1.7*	5.2*	1.3	4.4	1.3	4.5	1.5	4.6	1.5	4.4

* Excludes British Columbia and Yukon.

Source Same as Table 2-2.

provincial and local government employment for the period from 1976 to 1982.

Because of the absence of employment figures in British Columbia prior to 1979, it is difficult to make a comparison of the years before 1979 with those for 1979 and later. However, within each of these two periods, there is remarkable consistency in the level of employment by type of enterprise as a per cent of all provincial and local government employment for general services leading to the conclusion that the relative importance of the local enterprise sector vis-ã-vis the aggregated provincial/local sector has not changed. From 1979 to 1982, local sector employment amounted to 6 per cent or slightly more of all provincial and local employment combined. Approximately three-quarters of local government enterprise employment is absorbed by urban transit systems with slightly less than one-quarter being employed by electric power utilities and extremely small amounts by telephone systems. Data for gas distribution systems were not available (see Table 2-4).

Table 2-5 lists the regional variation in the relative importance of local government enterprise employment for electric power and urban transit systems from 1976 to 1982. With very few exceptions, urban transit employment exceeded electrical utility employment in every region and in some instances, particularly Quebec, by noticeable amounts. Once again in relative terms,

Ontario has the largest combined transit and electrical enterprise sector with Quebec, Alberta and Manitoba/Saskatchewan some distance behind. The Atlantic region and British Columbia displayed extremely small local government enterprise sectors over the same time.

Regional Concentration

While the preceding discussion provides a useful measure of the relative importance of certain local government enterprises within each region by relating their respective size (operating expenses and employment) to corresponding aggregated provincial/local figures, it does not generate a very accurate measure of the extent to which each local government enterprise is concentrated in the different regions. Tables 2-6 and 2-7 attempt to remedy this deficiency by viewing total operating expenses and employment in each region as a per cent of total operating expenses and employment figures for all local electric power (Table 2-6) and urban Transit Systems (Table 2-7) in Canada. For example, over 81 per cent of total operating expenses of all local electric power utilities in Canada were concentrated in Ontario in 1976. By 1982, over 77 per cent was concentrated in Ontario. At the same time, local electric power utilities in Ontario accounted for over 71 per cent of all employment in this sector in 1976 and almost 68 per cent in 1982 (Table 2-6). With the exception of Alberta, none

Table 2-6

Local Electrical Utilities Operating Expenses and Employment by Region as a Per Cent of Total Local Electrical Utilities Operating Expenses and Employment for Canada 1976-82

Region	1976	1977	1978	1979	1980	1981	1982
Atlantic Region							
Expenses	2.1	2.1	1.8	2.0	1.9	1.7	1.7
Employment	2.5	3.1	2.6	2.3	2.3	2.1	2.1
Quebec							
Expenses	2.7	2.5	1.3	2.8	2.9	2.6	3.1
Employment	3.6	3.7	4.1	3.8	4.0	3.5	3.7
Ontario							
Expenses	81.4	81.4	82.0	80.3	80.3	79.2	77.2
Employment	71.1	74.3	72.4	72.6	71.6	68.9	67.8
Man. & Sask.							
Expenses	3.5	3.3	3.4	3.3	3.1	3.3	2.9
Employment	7.6	7.7	8.2	8.1	7.8	7.3	7.2
Alberta							
Expenses	9.4	9.9	10.7	10.8	11.0	12.4	14.3
Employment	14.1	10.2	11.6	12.2	13.2	17.3	18.0
British Columbia							
Expenses	0.8	0.8	0.8	0.7	0.7	0.7	0.7
Employment	1.0	1.0	1.1	1.0	1.1	1.1	1.2

Source Calculated from unpublished data provided by Statistics Canada.

Table 2-7

Urban Transit Operating Expenses and Employment by Region as a Per Cent of Total Urban Transit Operating Expenses and Employment for Canada 1976-82

Region	1976	1977	1978	1979	1981	1982
Atlantic Region						
Expenses	1.4	1.3	1.3	1.5	1.5	1.7
Employment	2.0	1.5	1.7	2.0	2.1	1.7
Quebec						
Expenses	36.5	36.2	37.0	37.2	38.1	35.5
Employment	33.1	34.0	34.0	34.0	34.5	33.7
Ontario						
Expenses	47.1	46.3	44.6	44.5	42.0	42.5
Employment	49.2	47.8	47.0	46.9	45.4	45.4
Man. & Sask.						
Expenses	6.1	6.6	5.9	5.9	5.3	5.5
Employment	6.8	6.7	6.6	6.4	6.0	6.2
Alberta						
Expenses	8.6	9.2	10.6	10.4	12.7	14.2
Employment	8.6	9.5	10.1	10.2	11.4	12.5
British Columbia						
Expenses	0.3	0.5	0.5	0.4	0.5	0.5
Employment	0.4	0.4	0.6	0.4	0.7	0.5

Source Calculated from unpublished data provided by Statistics Canada. Data problems for 1980 precluded its inclusion.

of the other regions utilized local government enterprises for the provision of electricity to any great extent.

Similar observations can be made on the regional importance of urban transit systems (Table 2-7). Ontario, from 1976 to 1982, consistently employed between 45 and 50 per cent of the total number of people employed by urban transit systems in Canada and accounted for between 42 and 47 per cent of all operating expenses incurred by these same transit authorities. Quebec, although smaller than Ontario in absolute size, accounted for slightly more than 35 per cent of all operating expenses and slightly less than 35 per cent of total transit employment over the same period. By 1982, the size of the urban transit sector in Alberta had increased to a little less than one-third the size in existence in Ontario; whereas, it had been less than one-fifth Ontario's size in 1976. The remaining regions (Atlantic Canada, Manitoba/ Saskatchewan and British Columbia) had very little in the way of urban transit government enterprises and hence, contributed very little to the total Canadian operating expenses and employment levels in the urban transit sector.

Return on Assets

A further issue which has been raised on occasion is the profitability of the various local government enterprises. While profits in absolute terms or per local government enterprise may

Table 2-8

Rate of Return* by Type of Local Government Business Enterprise in Canada 1976-82

	1976	1977	1978	1979	1980	1981	1982
Electric Power	5.80	4.64	5.82	6.61	4.53	4.61	5.94
Urban Transit	n.a	n.a.	n.a.	n.a.	n.a.	-26.42	-26.29
Gas Distribution	-3.85	-4.69	-6.68	-6.25	-18.77	n.a.	n.a.
Telephone Systems	4.10	4.13	4.66	4.77	4.34	2.06	2.81

* Rate of Return = Net Autonomous Revenues (net income minus subsidies) as a per cent of Total Assets (net fixed and current and other).

n.a. - not available.

Source Calculated from unpublished data provided by Statistics Canada.

be useful, a better measure reflecting profitability comes from a calculation of the rate of return on the assets of the enterprise.[6] Table 2-8 illustrates these rates of return for the selected local government business enterprises from 1976 to 1982. Gas distribution and urban transit systems for the years when data were available displayed negative rates of return, thus indicating that subsidies were (and still are) provided to these enterprises. Both electric power utilities and municipal telephone systems indicated rates of return which did not vary by much over the seven-year period. Whether or not these rates are too high or too low requires the presence of a benchmark against which they can be compared. Since there appears to be no obvious benchmark, it is left up to the reader to judge their acceptability.

Of greater interest than Canadian averages for rates of return is the regional variation in the rate of return earned for each separate utility. Unfortunately, data on rates of return by region are only available for electric power utilities over the 1976 to 1982 period and for urban transit in 1981 and 1982. Tables 2-9 and 2-10 record these rates of return for electric power and urban transit respectively.

Ontario, which accounted for close to 80 per cent of all electrical power operating expenses in Canada from 1976 to 1982 (see Table 2-6), reported the most stable rates of return over the entire period. (Rates of return for individual utilities in

Table 2-9

Rate of Return* by Local Electric Power Utility by Region 1976-82

Region	1976	1977	1978	1979	1980	1981	1982
Atlantic Region	1.96	4.34	5.96	8.50	6.32	7.94	6.37
Quebec	16.52	15.12	14.54	14.70	12.47	7.98	13.29
Ontario	3.36	3.62	5.03	5.43	3.51	3.83	5.51
Man. & Sask.	10.00	8.82	16.98	21.08	16.17	5.43	11.17
Alberta	12.84	5.47	5.41	6.38	4.35	6.15	5.27
British Columbia & Yukon	10.57	8.02	8.24	9.11	6.98	8.57	13.08
Canada	5.80	4.64	5.82	6.61	4.53	4.61	5.94

* Rate of Return = Net Autonomous Revenues (net income minus subsidies) as a per cent of Total Assets (net fixed and current and other).

Source Calculated from unpublished data provided by Statistics Canada.

Table 2-10

Rate of Return* by Urban Transit Systems by Region 1981 and 1982

	1981	1982
Atlantic Region	-44.24	-33.86
Quebec	-67.07	-72.25
Ontario	-13.58	-14.14
Manitoba & Saskatchewan	-123.49	-129.55
Alberta	-19.73	-18.97
British Columbia & Yukon	-774.53	-722.41
Canada	-26.42	-26.29

Source Calculated from unpublished data provided by Statistics Canada.

Ontario will be discussed later.) While Alberta and the Atlantic region reported rates of return somewhat similar to those in Ontario, local power utilities in these provinces were considerably smaller in size.

The highest rates of return occurred in Quebec, Manitoba/Saskatchewan and British Columbia; however, it must be remembered that in each of these regions, total electrical power expenses amounted to 3 per cent or less of all electrical power expenses in Canada.

Similar regional variation was noted for urban transit (Table 2-10). The negative signs attached to the rates of return indicate that subsidies were provided to cover a share of the operating cost while the magnitude of the absolute figure provides us with a measure of the extent to which these subsidies existed. Ontario and Alberta which reported the smallest negative rate of return (Table 2-10), together accounted for between 55 and 60 per cent of all operating expenses on urban transit systems in Canada (Table 2-7). Quebec which accounted for between 35 and 40 per cent (Table 2-7) of Canadian urban transit expenses recorded a rate of return of roughly -70 per cent.

Summary

In reviewing the universe of local government business enterprise in Canada, the evidence in this section suggests that most of the enterprises, whether defined in absolute numbers (Table 2-1), or percentage of operating expenses or employment (Tables 2-6 and 2-7) are located in Ontario. At the same time, the majority of these enterprises are concentrated in the electric power industry (Table 2-1).

The largest proportionate increase in local government enterprise from 1976 to 1982 appears to have occurred in Alberta while the largest proportionate decrease has arisen in Ontario (Tables 2-6 and 2-7). Vis-ă-vis the aggregated provincial/local sector, operating expenses or employment levels of these same enterprises have not increased in any notable manner (Tables 2-2, 2-3, 2-4 and 2-5).

Finally, while some modest variation in the rate of return earned in the various local government enterprises by sector was evident (Table 2-8), greater variation within the electric power sector (Table 2-9) and urban transit systems (Table 2-10) by region was noted.

Notes

1 From discussions with officials at Statistics Canada, June 1984. It must be noted, however, that these percentages exclude data on municipal water supply systems. See note 2 for a discussion of this.

2 Statistics Canada's definition of local government enterprise specifically excludes water supply systems from the government enterprise category. This exclusion is defended because potential users are not free to acquire or reject this service. Once a water system is available, all potential users are compelled to connect with it and to pay for such a connection.

3 From discussion with officials of Statistics Canada, June 1984.

4 Because local versus provincial responsibility for providing local services varies across provinces, the provincial and local sectors are aggregated to maintain consistency across the country. This combined total is a benchmark against which the comparison of the local government enterprise sector is made.

5 Other measures such as a comparison of assets, capital stock and investment have been suggested. Unfortunately, accurate data on these possibilities are not available and hence, these measures have been ignored.

6 While there are various measures of rates of return, the choice of net autonomous revenue as a per cent of assets was reached because this was the measure for which reliable and accurate data were available.

3 PRICING BEHAVIOUR

While the extent to which local government enterprises in Ontario face controls over their investment activities and pricing policies varies, there tends to be three general approaches which have been adopted.[1] First, in the provision of water, whether through a utilities commission or a department at city hall, regulation of prices is non-existent. Second, regulation over pricing policies is legally controlled (by statutory legislation) in the provision of electricity and gas. Third, fares charged in the supply of local government transit services are not specifically controlled, yet a form of control (implicitly) may be exercised through the provision of municipal and provincial subsidies to offset operating deficits.

In the discussion of pricing to follow, no attempt will be made to address the issue of whether provision through the existing unit (utility commission, municipal department or contractual arrangement with a private firm) is more or less efficient than provision through an alternative organizational structure such as an unregulated private producer, a regulated private producer or a privately managed public enterprise. In other words, no attempt will be made to assess the cost differences in provision under the alternative organizational modes. Instead, the existing costs and

producing units have been accepted as the basis for the discussion on pricing policies. In a later section of this paper, considerable attention will be devoted to a discussion of the cost differences in the provision through the alternative organizational structures.

Before outlining the legal and institutional environment in which each type of utility operates, it may be useful to make a few comments on the appropriate pricing policy and investment decisions to be followed. Local governments and more specifically, local government enterprises, because of their constitutional status,[2] ought not to be concerned primarily with income distributional issues or with attempts to stabilize the level of economic activity. This is not to suggest that these are unimportant government objectives. Indeed, they are important and they should be handled by either provincial or federal governments who have the adequate resources and can internalize the spillovers which would arise from local government involvement. Local government enterprises, on the other hand, should view their major objective as providing their respective services in the most allocatively efficient manner. This will require proper pricing and investment decisions.

Principles

To achieve an efficient allocation of resources, the level of output should be produced up to the point where the price charged for an additional unit equals the extra cost of producing the same unit. In this instance, the price is a measure of the monetary value of the additional benefit received from consuming the last unit. The extra cost (marginal cost) refers to the opportunity cost of producing the last unit. If the price charged for the output exceeds its short run marginal cost, then the output will be undersupplied. If the price is below short run marginal cost, then the good or service will be oversupplied.[3]

As long as all benefits from the consumption of goods and services produced by local government enterprises accrue solely to the recipients of the outputs, the application of a price to cover the entire marginal cost is warranted. If, on the other hand, some of the benefits from these goods and services spill over onto residents who do not directly consume these goods and services, a case can be made for setting a price which covers part of the marginal cost (the private part) with other sources of revenue being used to fund the remainder of the costs.

Use of the right price has the important advantage of providing correct signals in terms of indicating the quantity and quality of goods and services that local residents desire. In the absence of

this price, there is no appropriate mechanism for signalling the proper demand for the local enterprise's output. When consumers are forced to pay a price for each unit consumed, their actions signal the quantity and quality of output desired. Alternatively, if these same outputs were financed from local tax revenues or fixed charges unrelated to quantity of output, correct signals would not exist. Local residents not being required to pay each time for each unit consumed, would perceive the price imposed for each additional unit as being essentially zero and, therefore, create a greater than optimal demand for the local output. The resultant misallocation of resources would arise because too many resources are being devoted to the provision of these specific goods and services.

While the equating of short run marginal cost with price is relatively straightforward in theory, it may be more difficult to achieve in practice. First, there is the problem of accurately estimating marginal cost. In some instances, there simply may not be enough data to measure precisely the marginal cost of providing government enterprise services. Nevertheless, the fact that a precise calculation of marginal cost applicable to those individuals or properties partaking of the service directly may not be calculated is, however, an inadequate justification for ignoring the marginal cost pricing approach altogether. To disregard this principle is tantamount to claiming that the alternatives are superior -- that is, financing from local taxes or employing

prices based on the average cost of provision. After all, if the case for marginal cost pricing is not argued by those who are concerned with efficiency in the allocation of public services, then it will rarely be made by local officials or residents in an organized or consistent fashion.

Second, it can be argued that local government enterprises are an important and integral component of the local government universe and since other local government services (plus goods and services produced elsewhere in the economy) are produced frequently where price diverges from marginal costs, there may be no reason to insist on local government enterprise provision at the point where the two are equal.[4]

Third, in instances where external benefits exist as in public transit for example, it is unlikely that local administrators will be able to achieve the efficient level of output. To do so would require a proper measure of the monetary value of the marginal external benefits along with the proper price for direct beneficiaries of the public service. If the former cannot be calculated, then the price is almost certain to be at a level too high for optimum efficiency.

Fourth, provision of a local government service at the level where price equals marginal cost may not generate enough revenue to cover the cost of supplying this service, that is, where price

is equal to marginal cost but less than average cost. In this instance, if certain conditions are met (that is, efficient markets exist elsewhere), then a case may be made for producing where price equals marginal cost and subsidizing the losses from tax revenues which are nondistorting.[5] Unfortunately, local taxes currently in use tend to be distorting and, therefore, a subsidization of local service provision may lead to a more efficient level of output of the subsidized service at the expense of creating greater inefficiencies in the areas from which taxes have been extracted. A further problem, however, may arise if the subsidized sector suffers from X-inefficiency[6] as a result of receiving this subsidy (the receipt of the subsidy may eliminate any incentive to minimize costs).

To overcome some of the practical difficulties of employing marginal cost pricing, one variant that has been suggested is the multi-part tariff. Here, the consumer pays a fixed charge for the privilege of using or gaining access to the facility or output and then pays a charge equal to the marginal cost of each unit consumed. In spite of some difficulty in achieving an optimal allocation of resources under this approach,[7] it "might produce results superior to the prices which would otherwise be set."[8] Overall, this pricing policy looks rather attractive as a means of financing many local public products. Clearly, it should be encouraged and its use extended in a number of areas where local

enterprises are not currently pricing their service in an appropriate manner.

In summary, a strong case can be made for marginal cost pricing in the following instances: (1) where externalities do not exist, (2) where individuals can be excluded from consuming the good, (3) where efficiency prevails in all other areas of the economy, (4) where precise measurements of output and cost can be calculated, and (5) where collection and administrative costs are low. In instances where these conditions are not so clearly defined, marginal cost pricing should be approximated for it is likely to lead to greater efficiency than alternative pricing schemes.

Practice

In pricing the output of local government enterprises, a number of schemes are currently in use. These range from fixed charges that are unrelated to the volume of output consumed, to charges that vary directly with the quantity consumed. A mixture of charges with both fixed and variable components lies in between. In addition, revenue from the various pricing structures is designed to cover somewhere between all or only a small proportion of all costs. Clearly, the decision as to the pricing structure and proportion of costs to be recovered cannot be related to a single or specific factor. Local tradition, the type of service, the tastes or preferences of the residents and the desire or lack

of desire of local politicians and administrators to substitute revenue from prices for local taxes all contribute to the policies adopted. Perhaps a review of local practices and the legal controls within which pricing and investment decisions are set in the Province of Ontario will aid in assessing the specific pricing policies for the different government enterprise outputs.

Water

Institutional Environment -- The provincial government has granted municipalities complete responsibility for the provision of water in Ontario. The only provincial standard which must be adhered to is that which is enforced by the Ontario Water Resources Commission and the Ministry of the Environment and stipulates that the quality of the final output must meet specific quality standards. Other than this, water systems, whether operated by the municipality itself, by a public utilities commission on behalf of the municipality, by a waterworks commission, by a water board or by the Ministry of the Environment are free to implement their pricing policies and investment decisions subject to various statutes. These statutes (The Municipal Act, The Public Utilities Act and The Ontario Water Resources Act) which are similar in content and reinforce each other, provide for a variety of methods of recovering water costs.[9] This variety, it is stated, "is provided so that municipalities of different sizes, status, geographic area and with different economic bases can

choose the one most suited to their particular local economic, geographical or political condition."[10]

Water rates are set at the discretion of the municipality or its water commission or committee[11] and relate to the receipt of a service and not to the ownership or occupation of a property. The rate is a charge to a customer for the operation, repair, maintenance and current capital costs of a water system.

The extent to which water rates are used to finance construction costs directly or to finance the debt costs associated with capital projects[12] is the subject of several statutes. Under the Local Improvement Act (Section 3), the rates set for capital projects must apply specifically to the lots benefitting from the projects. By comparison, The Municipal Act (Revised Statutes of Ontario, Chapter 284, Section 362 (2)) allows municipalities to impose rates to cover capital costs on owners or occupants of land who derive, will or may derive benefits from these capital works. Finally, The Public Utilities Act (Sections 14 and 16) allows municipalities to impose rates to cover capital construction costs even though the owners or occupants of the property are not connected to the service.

The implementation of a price or charge for water is at the discretion of the municipality. If a municipality elects not to charge a price for water, then it is required to recover its costs

through the implementation of a mill rate on all taxable assessment (The Municipal Act, Section 302). No municipality in Ontario resorts entirely to mill rates for recovering water costs, however a large number use the mill rate (frequently called "hydrant rental" or "fire protection" revenue) to generate revenues to cover the cost of fire protection. The rationale for this is that property taxes are a measure of property values which in turn relates to fire protection requirements. In 1975, about 5 per cent of current water revenue came from the mill rate with less than 15 per cent of municipalities surveyed raising more than 20 per cent of current revenues.[13]

Additional revenues used to cover offsite capital works take the form of lot levies, or cash imposts which are imposed on developers and designed to cover the cost of connecting new developments to the exiting system (The Planning Act, Sections 29, 33, 35, 42(2), and 42(3) and The Condominium Act, Section 24). Additional water capacity may be financed from special redevelopment charges levied under The Municipal Act (Section 359).

In surveying the available evidence on water rate structures in Ontario, it appears as if the current rates have simply evolved over time. Virtually nothing is known about the principles underlying the establishment of the original rate structure. From time to time, these structures have been modified to reflect changes

in experience or in the political or financial environment encompassing the local community.

While there are numerous rate structures employed in the various municipalities in Ontario, Table 3-1 illustrates a typical rate schedule. This combination of a metered rate schedule (consumption charge) and other fixed charges such as a service charge, an unmetered fire line charge and a minimum bill is prevalent in many municipalities; however, a few municipalities use only a consumption charge to raise all of their water rates revenue. Other municipalities, primarily smaller ones although there are a few large systems as well, use predominantly flat rate charges.[14]

Tables 3-2 (residential) and 3-2a (non-residential) yield some information on the type of rate structure (metered or flat rate) employed by municipalities of different sizes under each of three organizational structures, specifically local commission, local council and regional government. While communities of less than 50,000 people tended to have a larger proportion of commissions, the larger communities were more commonly operated by local councils or regional governments. Overall, utility commissions exceeded local councils as an organizational mode for administering the local provision of water.

Table 3-1

Example of Water Rate Schedule in Ontario (Monthly)

Metered Rates

0 to 45 cubic metres - $0.16/cubic metre
46 to 450 cubic metres - 0.13/cubic metre
451 cubic metres & over - 0.11/cubic metre

Service Charge and Minimum Bill

Meter Size (Inches)	Service Charge ($)	Minimum Bill: Consumption Allowance (Cubic Metres)	Minimum Bill: Charge ($)
¾	3.84	5	4.64
1	6.56	10	8.16
1½	11.79	15	14.19
2	20.21	20	23.41
3	34.06	35	39.66
4	67.18	70	77.63
6	120.60	125	138.20

Unmetered Fire Lines

Service Size (Inches)	Unmetered Fire Line Charge ($)
2	15
4	50
6	100
8	150

Source Water Rates in Ontario: Principles and Practices, Ontario Municipal Water Association and Ontario Section, American Waterworks Association, May 1979.

Table 3-2

Residential Water Rate Structure by Organizational Type and Size of Municipality for Selected Ontario Municipalities* in 1983

Size of Municipality	Commission			Council			Regional Government			Total Number of Communities
	Total	Metered	Flat Rate	Total	Metered	Flat Rate	Total	Metered	Flat Rate	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0 - 5,000	36	11 (31)	25 (69)	16	7 (44)	9 (56)	8	8 (100)	-	60
5,001 - 10,000	17	12 (71)	5 (29)	10	4 (40)	6 (60)	3	3 (100)	-	30
10,001 - 25,000	7	5 (71)	2 (29)	4	2 (50)	2 (50)	1	1 (100)	-	12
25,001 - 50,000	6	6 (100)	- (-)	4	1 (25)	3 (75)	-	- (-)	-	10
50,001 - 100,000	4	3 (75)	1 (25)	6	5 (83)	1 (17)	-	- (-)	-	10
100,001 - 200,000	1	1 (100)	- (-)	4	4 (100)	- (-)	3	3 (100)	-	8
200,001 +	2	2 (100)	- (-)	3	3 (100)	- (-)	1	1 (100)	-	6
Total	73	40 (55)	33 (45)	47	26 (55)	21 (45)	16	16 (100)	-	136

* The municipalities selected were those for which detailed data on pricing policies were available. Some communities which reported metered rates also imposed a fixed charge (unrelated to water consumption). In this survey, these communities are included in the metered structure because the consumers can control the size of their water bill by altering their consumption. The figures in parentheses in columns 3, 4, 6, 7 and 9 reflect the percentage of metered versus flat rate communities under each organizational type.

Source 19th Annual Survey of Municipal Water Rates in Ontario, 1983, American Water Works Association, Toronto, Ontario, 1984.

Table 3-2a

Non-Residential Water Rate Structure by Organizational Type and Size of Municipality for Selected Ontario Municipalities* in 1983

Size of Municipality	Commission			Council			Regional Government			Total Number of Communities
	Total	Metered	Flat Rate	Total	Metered	Flat Rate	Total	Metered	Flat Rate	
0 - 5,000	36	33	3	16	13	3	8	8	-	60
5,001 - 10,000	17	17	-	10	10	-	3	3	-	30
10,001 - 25,000	7	7	-	4	4	-	1	1	-	12
25,001 - 50,000	6	6	-	4	4	-	-	-	-	10
50,001 - 100,000	4	4	-	6	6	-	-	-	-	10
100,001 - 200,000	1	1	-	4	4	-	3	3	-	8
200,001 +	2	2	-	3	3	-	1	1	-	6
Total	73	70	3	47	44	3	16	16	-	136

* See the note at the end of Table 2.

Source Same as Table 3-2.

Table 3-3

Number of Municipal Electric Utilities with and without Debentures and Long Term Debt Outstanding by Customer Size, 1982 (Ontario)

Number of Customers	Borrowing	No Borrowing	Total
0 - 1,000	40	117	157
1,001 - 2,000	42	21	63
2,001 - 5,000	33	11	44
5,001 - 10,000	17	0	17
10,001 - 15,000	9	0	9
15,001 - 25,000	13	0	13
25,001 - 50,000	12	0	12
50,001 - 100,000	4	0	4
100,001 and over	4	1	5
Total	174	150	324

Source Calculated from Statistical Yearbook, 1982, Ontario Hydro, Toronto, Statement A.

Table 3-2 records the number of municipalities employing meters and flat rate charges as a means of charging residential users for their water consumption. Regardless of the organizational mode, metered charges were relatively more predominant in larger vis-à-vis smaller communities.

While all regional governments surveyed employed metered rates, only 55 per cent of utility commissions and 55 per cent of local councils used this pricing structure for collecting revenue from residential users. When compared by size of community, metered rates were utilized by roughly the same proportion of all large communities (over 50,000 people) regardless of whether this service was provided through a local commission or a local council (Table 3-2). For those communities of less than 50,000 people, such consistency across local council and commission operations was not observed. Almost 70 per cent (25 communities) of all commissions run operations in communities under 5,000 used flat rate charges for residential consumption while 56 per cent (9 communities) of council run operations used this rate structure. Furthermore, flat rate charging schemes were relatively more important for council run operations in communities from 5,001 to 50,000 people while similar flat rate schemes were relatively less important (column 4 of Table 3-2) in the same size communities under commission run operations.

Turning to non-residential (commercial and industrial) pricing schemes, it is noted that, with the exception of three small commission run operations and three small council run operations which employed flat rate charges (under 5,000 people), all of the remaining communities used metered charges for non-residential water consumption.

In summary, there are no restrictions on the format of the water rate structure. Charges, flat rate or metered, tend to cover the bulk of operating and repair costs. Extending or renovating the waterworks system or expanding the capacity is generally financed from special charges and/or provincial and federal grants. Any remaining deficit may be offset through the application of a general mill rate on assessed property value. Finally, while considerable variation does exist in the organizational structure (local commission versus local government versus regional government) responsibility for providing water to local residents, there does not seem to be any significant pattern associating metered charges as opposed to flat rate charges with any particular organizational type. Instead, the charging system tends to be more highly correlated with the overall population base of the municipality, that is, larger communities seem to favour metered rates while smaller communities tend to be relatively more dependent on flat rate charges.

Evaluation -- Having mentioned earlier that local governments should be concerned primarily with the allocation of resources in the most efficient possible manner, it remains to be stated that the establishment of an efficient pricing policy (marginal cost equalling price) can best be achieved for publicly provided outputs with private good properties. Perhaps the best example of a local public good with these characteristics (benefits from consumption accrue almost exclusively to those directly consuming the good) exists in the provision of residential and commercial/industrial water. Given this, it is somewhat surprising to note the variation in charges (prices) actually employed and the extent to which these charges appear to deviate from serious attempts to achieve economic efficiency. In fact, economic efficiency seems to be of secondary concern to those responsible for establishing water charges.

There are three issues which should be addressed in the evaluation of local water pricing schemes. First, the extent to which fixed rate charges are inferior to metered charges. Second, the extent to which the existing metering schemes could be improved. Third, the extent to which pricing policies vary with the organizational mode responsible for providing water. Fixed charges that are unrelated to the quantity consumed create the same problems as those that exist in any instance where the consumer can control the quantity used up and where he or she is not required to pay a specific price for each additional unit consumed. The lack of a

proper pricing policy dictates that there is no correct mechanism for rationing water nor is there any effective means of determining the desirable quantity and quality of the good to be provided.

In light of obvious deficiencies with fixed charges, it is surprising to note that 26 of 57 large Canadian municipalities surveyed in 1971 actually employed water rate charges for residential consumption that were unrelated to the quantity consumed.[15] For 1983, the Ontario data (Table 3-2) recorded relatively fewer large centres using flat rate charges for residential consumption but a proportionately larger number of small communities continued employing pricing structures unrelated to the quantity of water consumed. As well, data collected in the 1971 survey indicated that average yearly consumption per dwelling unit was roughly twice as high in centres using flat rates as in those communities using metered rates. Since many municipalities have expanded their water systems to meet excessively high demands, considerable overinvestment has been created in most flat rate centres. In fact, in a few of the municipalities surveyed, local officials originally employing flat rate charges for water consumption and operating with a system at full capacity had been faced with the problem of either expanding the facility to meet the demand or attempting to reduce the demand. In each case, a decision was taken to introduce metered rates with the consequent result that demand fell drastically. What had been a fully utilized system

became a system with excess capacity. Given that evidence, it is difficult to understand why the remaining flat rate centres have not converted to metered charges.

In most Canadian municipalities with metered systems, the tendency is to use a declining block rate schedule with a fixed minimum charge. While this rate schedule varies from municipality to municipality,[16] a typical schedule was presented in Table 3-1. Unfortunately, a pricing policy of this type can lead to undesirable consequences. Consumers without dishwashers, multiple cars to wash, and large lawns to sprinkle subsidize those individuals with dishwashers, large lawns and many cars. As well, residential users subsidize commercial and industrial users.

Current emphasis on a pricing structure that declines as quantities consumed increase can be justified on efficiency grounds if the marginal cost of providing water continuously declines. Some evidence suggests, however, that the average and marginal operating costs are not falling continuously as quantities consumed increase.[17] As well, "the marginal price charged for water... is almost always less than its marginal cost."[18] In addition, many users in metered centres do not consume enough to raise the amount they pay above the minimum bill, hence their true marginal price is effectively zero, exactly the same as in centres with flat rate charges. This type of pricing policy may lead to excessive demand and overinvestment in

the water plant. By definition, overinvestment in one sector uses resources that could more optimally be employed elsewhere.

In the case of water provision as with most other local services, the distance from the source of supply clearly affects the marginal cost of providing the good. Residents on the perimeter pay the same price per unit as those near the source, yet the marginal cost of providing the good to those further away is noticeably higher.[19] Optimal efficiency dictates that the pricing structure be altered to reflect the marginal cost of providing water. Failure to do this leads to users with lower marginal costs subsidizing those with higher marginal costs and to a subsequent capitalization of these subsidies into land values with the land value at the fringe or on the outskirts being priced higher than would otherwise be the case.[20]

Recognizing the distinct advantages inherent in a proper pricing policy for water consumption, at least two Canadian authors[21] have suggested that it is not metering alone that is important in controlling demand and hence reducing the degree of overinvestment in water facilities, rather it is the price charged that matters. In principle this is certainly true; however, in practice metering also has had considerable effect on controlling the demand. For example, a number of local officials have suggested that consumers perceive metered rates as being higher than fixed charges when, in fact, this may not be true. In this instance it is the customer's

perception of the charge that is important in controlling quantities demanded. Furthermore, the fact that water prices are so low and that water expenditures, in total, absorb such a small fraction of consumers' total expenditures suggest that many customers ignore this charge when making water consumption decisions. Once again, the exercise of metering is likely to be more important than frequently has been recognized by most writers on this topic.

The lack of an appropriate pricing policy has created excessive demands for water in certain months (summer) and at certain times of the day (late afternoon or evening). Unfortunately, local officials have been concerned more frequently with building facilities large enough to accommodate this consumption rather than adopting a pricing policy, issuing warnings, or establishing controls to reduce the demand.[22] Seasonal or peak-load pricing, although potentially difficult to implement, has proven to be effective in allocating resources in the private sector and should be seriously considered as a pricing policy in the provision of water.

Although there may be difficulties in accurately measuring marginal costs and then assigning prices to cover them, there is, nevertheless, a case to be made for closely approximating the marginal cost pricing principle. This might consist of the adoption of a multi-part tariff system discussed earlier.

Briefly, this kind of system would involve fixed charges for on-site capital expenditures and any required connection charges plus further charges reflecting approximations of the variable costs of actually providing the water to each user. Since the marginal cost of supplying water varies directly with the distance from the source, users would be required to pay prices that reflect operating and maintenance costs.[23]

For the purposes of this study, the issue of whether the organizational mode exerts specific influences on pricing policies must be addressed. The choice of fixed versus metered rates, for example, tends not to be correlated with organizational structure. Instead, this choice tends to depend on community size and whether water is being provided to the residential versus the non-residential sector. Where the impact of the organizational mechanism has some effect is on the relative cost or efficiency of providing water (see Chapter 4 for discussion). Since prices are set to cover costs, variations in price arise because of variations in cost and not because of organizational structure. In addition, the fact that both the commission and city hall operations are public firms suggests that the managers of each of these organizations has little incentive to set prices so as to accumulate profits and hence, maximize the owners' wealth, especially since the owners are the consumers of the output. Instead, each manager may be more interested in maximizing his/her utility by expanding the size of the budget or operation for which

he/she is responsible.[24] One way of doing this, of course, is to expand output by keeping prices down,[25] a feature which appears to be consistent with current water utility systems.

In attempting to both expand the local utility and to minimize the number of complaints from angry customers, commission and city hall managers may have an incentive to utilize more advanced production techniques and to have more productive capacity than might be economically desirable. Indeed, this behaviour can be defended politically by the argument that the welfare of future generations is being protected. This incentive to expand the capital stock and hence, increase capacity creates less opportunity for breakdowns and fewer interruptions in service and hence, fewer customer complaints.[26]

Electricity

Institutional Environment -- While most goods and services provided through local governments or local government enterprises are both produced and distributed by the municipality or municipal enterprise itself, electricity is almost entirely generated by Ontario Hydro alone. In 1982, for example, less than one-tenth of 1 per cent of all electricity passing through municipal utilities was generated by municipal utilities.[27] The primary responsibility of the municipal utility then, is to distribute to its customers the electricity which it purchases from Ontario Hydro.

Ontario Hydro, in addition, directly supplies more than 100 industrial customers and approximately 763,000 retail customers in rural areas which are not served by municipal utilities.[28]

The Power Corporation Act (Section 76) stipulates that power be supplied to municipalities at cost. This includes charges for operation, maintenance, administration, depreciation, reserve adjustment and fixed charges. Fixed charges include interest and expenses of debt servicing along with a debt retirement charge adequate to retire outstanding debt over a 40-year period. Also authorized for inclusion as of 1981 is the cost of an energy conservation program and any revenue shortfall resulting from the rural rate differential adjustment.

Each year, each municipal utility, of which there are 324 in Ontario, must have its own rate increases and budgeted expenses approved by Ontario Hydro. The basis for an approved rate increase facing municipal customers is an increase in utility costs plus, what is called, a normal rate of return. This rate of return for each utility is calculated on a base which is defined to include net fixed assets less contributions in aid of construction (provided by private developers rather than the municipality itself) plus a specified percentage of net operating expenses (excludes depreciation and amortization). This projected rate of return is designed to allow utilities to earn net income which can be used for debt retirement in the current year (in

those utilities where there is some outstanding debt) or can be accumulated in the form of cash and investments and eventually used to finance future capital expenditures or simply retained as protection against unforeseen increases in operating expenses or unanticipated shortfalls in operating revenue.

For municipalities in need of upgrading or enlarging their capital structure (usually consists of line upgrading or expansion and construction or enlargement of substations or power distribution stations), all capital projects must be approved by Ontario Hydro. Funding for these projects is at the discretion of the local utility and consists of financing from current operating revenues or accumulated revenues which have been deposited in reserves and set aside for this purpose plus long-term borrowing, primarily through debentures and other long-term securities.[29] For utilities choosing to borrow for capital projects, municipal council must approve all requests for funds and borrow on the electric utilities behalf. The number of electric utilities which had borrowings via debentures and other long-term debt in 1982 compared with utilities without debt from borrowings is recorded in Table 3-3. In 1982, with the exception of the City of Toronto, all utilities with more than 5,000 customers had outstanding long-term debt suggesting that borrowing is a major means of raising capital funds in these larger utilities. For smaller utilities, there is a greater tendency to use current revenue to fund capital projects. Such a tendency towards funding is not surprising given

the relatively easier task (lower interest rate because of better credit rating) of borrowing in larger communities.

In every municipality in Ontario, the rate structure for electrical consumption is similar to that for water consumption. It is based on a declining block structure (see Table 3-1) with a minimum monthly charge. While the actual rates vary,[30] there is a common tendency to fix the residential rate at a specific price for the first 250 KWH and then a lower price for the remaining consumption. For general users (industrial and commercial), the block rate also exists although the rates differ and there may be more blocks. The cost of street lighting is billed to the municipality and funded from general revenues or more specifically, funded from local tax dollars. In establishing the size of blocks, local utilities have accepted the recommendations arising from a study completed for Ontario Hydro in 1965. This action has led to substantial uniformity in the size of blocks currently in use, although the rates charged per block tend to vary from utility to utility.

A local utility (and this is also true for utilities providing water) pays a grant in lieu of property taxes to the municipality in which it is located. In many cases, this grant is designed to cover some of the municipalities general and education costs. In a few municipalities, the grant is lower because the utility does

not contribute towards the cost of education. On the other hand, any net revenue generated through a utility is not subject to the corporate tax. As well, this net revenue cannot be used to finance other parts of the municipal or utility operation; for example, an accumulation of net revenue from electrical sales cannot be used to finance costs attributed to the water operation which may be provided through the same utility (and vice versa).

For services provided by municipal governments, locally elected councillors are ultimately responsible for ensuring that local public goods and services are provided in an effective and efficient manner. For utility services, utility commissioners share the same responsibility; however, the way in which utility commissioners are chosen is not the same across the province of Ontario. For example, Table 3-4 records the number of municipalities by customer size who have (i) elected commissioners; (ii) commissioners appointed by council; or (iii) a committee of council. Over 80 per cent of all utilities have elected commissioners while slightly less than 10 per cent are either appointed by council or are under the direction of a committee of council. Those utilities under a committee of council are concentrated in the smaller utilities. With the exception of one, all have fewer than 1,000 customers. Those appointed by council are spread throughout the entire range but almost 50 per cent are located in utilities with less than 2,000 customers. Elected utility

Table 3-4

Choice of Electrical Utility Commissioners by Customer Size of Utility, 1983 (Ontario)

Number of Customers	Elected		Appointed by Council		Committee of Council	
	Number	Per Cent of all Utilities in Same Group Size	Number	Per Cent of all Utilities in Same Group Size	Number	Per Cent of all Utilities in Same Group Size
0 - 1,000	123	78.3	5	3.2	29	18.5
1,001 - 2,000	54	85.7	9	14.3	0	0
2,001 - 5,000	41	93.2	2	4.5	1	2.3
5,001 - 10,000	15	88.2	2	11.8	0	0
10,001 - 15,000	7	77.8	2	22.2	0	0
15,001 - 25,000	11	84.6	2	15.4	0	0
25,001 - 50,000	7	58.3	5	41.7	0	0
50,001 - 100,000	3	75.0	1	25.0	0	0
100,001 and over	2	40.0	3	60.0	0	0
Total	263	81.2	31	9.6	30	9.3

Source Calculated from information provided by Ontario Municipal Electric Association, June 1984.

commissioners exist in all utilities ranked by size of customers; however, elected commissioners are relatively more dominant in the under 25,000 customer range.

Evaluation -- The provision of electricity through a local utility is highly regulated and tightly controlled. Not only do technical controls over standards which must be adhered to in the municipal distribution network exist, but regulations governing capital replacement or expansion and operating rate increases are also carefully monitored.

This close monitoring by Ontario Hydro of local utility operating expenses, capital projects and rate increases suggests that local commissioners and enterprise officials have little discretion in policy decisions. As mentioned earlier, local utilities are allowed rate increases which reflect increased operating costs plus a normal rate of return; however, the approved rate of return is ultimately determined by Ontario Hydro. Revenues generated by this return are used for purposes of retiring outstanding debt and are accumulated and invested in capital assets or held as working funds in the utility.

Table 3-5 records net income per customer generated by municipal electrical utilities (Ontario) in aggregate for 1978-82. In current dollars (column 4), net income per customer (on average) rose from $35.86 in 1978 to $42.04 in 1979, then fell to $27.72

Table 3-5

Net Income per Customer Generated by Municipal Electrical Utilities in Aggregate (Ontario) 1978-82

Year	Appropriated for Debt Retirement	Added to Accumulated Net Income	Total		Net Income as a Per Cent of Operating Expense	Net Income as a Per Cent of Net Fixed Assets	Net Income as a Per Cent of Assets*
			Current	Constant			
(1)	(2)	(3) (dollars)	(4)	(5)	(6)	(7)	(8)
1978	n.a.	n.a.	35.86	35.86	5.2	6.6	5.2
1979	n.a.	n.a.	42.04	38.49	5.6	7.3	5.5
1980	5.09	22.63	27.72	23.04	3.2	4.6	3.0
1981	5.91	26.83	32.74	24.17	3.4	5.1	3.8
1982	6.57	44.63	51.20	34.15	4.9	7.4	4.7

* Net Autonomous Revenue (Net Revenue minus Subsidies) as a per cent of net fixed assets plus current assets plus other assets.

n.a. Breakdown not available.

Source Calculated from Statements A, B, C and D, Ontario Hydro Statistical Yearbook, annual, Ontario Hydro, Toronto.

and $32.74 in 1980 and 1981 respectively before rising to $51.20 in 1982. This cyclical decline in the early 1980s was largely a result of the government restraints program which filtered down through Ontario Hydro's restrictions on the net income which could be earned by municipal utilities. Of this per customer net income, the bulk of it (over 80 per cent) went into accumulated income to be used as working capital or to finance capital investments in the future. In 1980, slightly more than $5 went to debt retirement while a little more than $6.50 went to debt retirement in 1982 (column 2). In real terms, the per capita net income generated was almost the same in 1982 as in 1978 (column 5).

Perhaps a more interesting comparison is that which is presented in columns 6, 7 and 8. Column 6 lists net income as a per cent of operating expenses for each year. This ranged from 5.2 per cent in 1978 to a low of 3.2 per cent in 1980 and then, a high of 4.9 per cent again in 1982. Since operating expenses are matched by customers' total payments, these figures correspondingly reflect the net income as a per cent of actual money paid by the customer.

Column 7 records the rate of return on net fixed assets.[31] This reached a high of 7.4 per cent in 1982, rising from a low of 4.6 per cent in 1980. Column 8, on the other hand, records net autonomous revenue as a per cent of total assets (net fixed assets plus current and other assets). These figures although lower than

those in column 7 display the same general pattern over the five-year period. Perhaps of more interest is the variation in rates of return by utility size. Table 3-6 records this variation for 1982. As can be noted from the coefficient of variation (a measure of relative dispersion), there are substantial differences amongst local utilities of similar size although the average rate of return in each group seems to be roughly similar.

Whether or not the continuous generation of aggregate net income (although in any given year, a few utilities incur losses which are more than covered by net income in subsequent years) through the approved annual rate increases can be justified may be a subject of some contention. Justification for a rate increase based on a projected increase in operating costs is acceptable on allocative efficiency grounds (this is distinct from the issue of whether the correct pricing policy is being followed in the first instance, an issue which will be discussed below). Similarly, justification for a rate increase to provide a return on equity (equal to the opportunity cost) is justified on allocative efficiency grounds. However, justification for a rate increase to generate net income to be accumulated and used for capital investment projects whose beneficiaries will be future customers is difficult to accept on allocative efficiency grounds. If future customers are beneficiaries of capital investment projects, then future customers, not current customers, ought to pay for these projects. This could be achieved by borrowing to finance

Table 3-6

Rate of Return* - Municipal Electrical Utilities in Ontario

Size by KWH	All Municipalities	100,000,000 and Over	50,000,000 to 99,999,999	20,000,000 to 49,999,999	0 to 19,999,999
Mean	4.6750	4.9875	4.4254	4.9167	4.4992
Standard Deviation	6.3933	3.0662	4.9959	4.5456	7.9811
Coefficient of Variation	1.37	.61	1.13	.92	1.77
Sample Size	324	65	26	65	168

* Net Autonomous Revenue (Net Revenue minus Subsidies) as a per cent of net fixed assets plus current assets plus other assets.

Source Calculated from Ontario Hydro Statistical Yearbook, Ontario Hydro, Toronto.

capital expenditures with future operating revenues being used to service and retire the debt.

Approval of a rate increase to allow utilities to acquire a pool of funds to meet unforeseen operating expenses or revenue shortfalls may be desirable as long as these funds are not allowed to continue accumulating without being required. Table 3-7, for example, records the per customer sum of cash, bank deposits and short-term investments (this is a rough approximation of the extent to which net income has accumulated within local electrical utilities) which had accumulated by the end of each of the years from 1978 to 1982. This figure rose from $76.13 in 1978 to $100.20 in 1982 in current dollars. In real terms, though, a decrease from $76.13 to $66.83 was witnessed over the same period (Table 3-7). While there may be no a priori basis for determining the proper level of funds for this purpose, the fact that roughly 85 per cent of the operating costs of local utilities is incurred through the purchase of electricity from Ontario Hydro and the fact that Ontario Hydro is responsible for approving local utility rate increases suggests that there is a strong incentive provided to Ontario Hydro to grant local utilities reasonably attractive rates of return to ensure that they (local utilities) earn sufficient revenues to be able to pay Ontario Hydro for the cost of electricity purchased. Indeed, this incentive may be sufficient to allow local utilities through higher than necessary rates, to accumulate unnecessary sums of revenue.

Table 3-7

Per Customer Cash, Bank Deposits and Investment by Local Electrical Utilities (Ontario) 1978-82

Year	Per Customer Total	
	Current Dollars	Constant Dollars
1978	76.13	76.13
1979	91.47	83.75
1980	85.00	70.65
1981	89.85	66.33
1982	100.20	66.83

Source Calculated from Statements A, B, and C, Ontario Hydro Statistical Yearbook, annual, Ontario Hydro, Toronto.

Since the approved increase in annual rates is based on increases in projected operating costs, plus a rate of return (currently set at 15 per cent) based on operating expenses minus depreciation and amortization, it is possible for a utility to increase its actual annual net income by overestimating its operating expenses. The extent to which any utility can continue to generate net income in this way may be dependent upon its ability to convince Ontario Hydro to approve the proposed operating expenses each year. If proposed operating expenses continue, year after year, to be overestimated leading to larger than projected net income, Ontario Hydro may refuse to approve such large increases in these expenses. While it is impossible to test statistically for the number of instances in which Ontario Hydro has exercised control over allowable increases in a utility's operating expenses, conversations with local administrators and Ontario Hydro officials suggest that this has happened. Unfortunately, it is not clear whether this control has been exercised because of past accumulation of net income or whether it is designed to control increases in current electricity rates charged to customers.

This regulatory role played by Ontario Hydro has been defended from two different positions, one which is based on restricting rate increases and the other which argues in favour of allowing rate increases. For example, Ontario Hydro's regulatory role, on the one hand, is intended to protect customers from excessive rate

increases which may be imposed by local utilities. On the other hand, the approval of rate increases may be necessary to ensure that local utilities generate sufficient revenues to pay for the electricity purchased from Ontario Hydro. Further control over local utilities is exerted where funds must be borrowed for capital expenditures. Here, local councils are required to both approve the projects and to borrow on behalf of the local utility. As well, Ontario Hydro has a team of municipal accountants whose only purpose is to provide advice and audit the financial statements of local utilities. The combination of these factors suggests that there are reasonably tight controls placed over the range of activities in which local utilities can engage and on the behaviour of the managers of these utilities.

By contrast, the controls facing Ontario Hydro are virtually non-existent. Ontario Hydro submits its proposed rate increase (that is, the rate which it intends to charge for electricity sold to local utilities) to the Ontario Energy Board who, in turn, may recommend lower rates. Ontario Hydro, however, is not compelled to accept this recommendation and ultimately decides on the rate increase which it will implement.

In evaluating the existing declining block rate pricing structure actually employed by local electrical utilities, one may offer many of the same criticisms as were presented under current water pricing policies. Some sketchy evidence suggesting that

marginal cost pricing policies are not being followed is extracted from the basis on which rates are approved by Ontario Hydro (more than increases in operating costs are included in the formula for rate increases). As well, electricity rates within a municipality often do not vary with peak demand nor according to the distance between customer and the source of supply. Changes to capture each of these effects could prove effective in controlling demand and hence, investment in capital facilities. Overinvestment, however, by local utilities in the transmission and distributional services is unlikely to be very significant, certainly not as significant as in the generation stage,[32] a service which is provided almost entirely by Ontario Hydro.

Because of the existence of fairly tight controls over the policies of local electric utilities, there is no evidence to suggest that different pricing decisions are made in utilities governed by elected rather than appointed commissioners. (In Ontario in 1982, over 81 per cent of local utilities were governed by elected rather than appointed officials -- see Table 3-4.) Indeed, a cursory review of the rate structures[33] displays the same degree of variation in both elected and appointed commissions.

In summary, this evaluation suggests that the legal and institutional environment exerts significant controls over the pricing and investment behaviour of local electric utilities. As

well, there is no evidence to suggest that different pricing and investment decisions are made under elected as opposed to appointed utility commissioners.

Urban Transit

Institutional Environment -- There are a few environmental features which differentiate the provision of municipal transit services from the provision of potable water and electricity. First, perhaps the most important is that both water and electricity are services for which there tend to be no close substitutes; whereas, public transit faces some reasonably close substitutes (taxis, private automobiles, bicycles, walking, etc.). Second, water and electricity are two services displaying extensive private good characteristics (that is, the benefits from consuming these services are confined almost entirely to the direct recipients) while public transit displays some public good traits, namely through the existence of externalities. These arise because the existence of a public transit system generates benefits to both users and non-users. Users benefit directly while non-users benefit indirectly, that is, non-users face less congestion on roads and other types of transit services and hence, are better off because of the existence of a public transit system. The existence of these externalities along with the local governments' interest in assisting in income redistributional issues have been the motivating factors behind the policy whereby

operating revenues are designed to cover only a fraction of operating costs. Table 3-8 provides the average percentage of operating costs which are covered by operating revenues for municipalities ranked by size of municipality and by the organization responsible for providing the service in Ontario in 1982. For example, for all municipalities of less than 50,000 people, less than 40 per cent of costs were covered by operating revenues. Within this population group, 16 transit systems were contracted to the private sector while seven were operated directly by a municipal department, one by a separate transit commission and one by a public utilities commission. In comparing the contracted service with that provided by municipal departments, on average the contractors recovered a higher proportion of their costs from operating revenues, although there was some variation in this proportion within each organizational structure. Indeed, the coefficient of variation, which is a measure of the relative distribution of the individual communities about the average for that particular group, suggests that moderately greater variation in the percentages of operating costs recovered existed under municipal departments than under private contractors.

For the 19 transit systems in municipalities from 50,001 to 200,000 people, revenues covered slightly more than 48 per cent of all operating costs. Ten of these systems were operated directly by a municipal department while five were the responsibility of

Table 3-8

Percentage of Average Operating Cost Recovered from Average Operating Revenues by Municipality Size and by Organization Responsible for Providing Local Transit Services, 1982 (Ontario)

Size of Municipality	Contracted to Private Sector				Municipal Department				Transit Commission				Public Utilities Commission				Total			
	No.	Av. %	S.D. %	C.V.	No.	Av. %	S.D. %	C.V.	No.	Av. %	S.D. %	C.V.	No.	Av. %	S.D. %	C.V.	No.	Av. %	S.D. %	C.V.
0 - 25,000	9	40.0	7.3	.18	4	37.2	14.2	.38	-	-	-	-	-	-	-	-	13	39.1	10.3	.26
25,001 - 50,000	7	34.3	7.8	.23	3	30.3	6.8	.22	1	54.5	-	-	1	40.7	-	-	12	35.5	9.4	.26
50,001 - 100,000	1	37.2	-	-	6	45.3	3.7	.08	3	55.8	15.1	.27	2	52.7	4.0	.08	12	48.5	9.9	.20
100,001 - 200,000	-	-	-	-	4	43.0	5.9	.14	2	59.0	3.7	.06	1	49.1	-	-	7	48.4	8.8	.18
200,001 and over	-	-	-	-	2	49.6	5.2	.10	3	67.6	5.1	.08	-	-	-	-	5	60.4	10.2	.17
Total	17	37.5	7.9	.21	19	41.2	10.0	.24	9	60.3	10.8	.18	4	48.8	5.7	.12	49	43.6	12.6	.29

No. = Number of municipalities.
Av. = Average for all municipalities in that group.
S.D. = Standard deviation.
C.V. = Coefficient of variation - this is obtained by dividing the average by the standard deviation.

Source Calculated from data in Ontario Urban Transit Fact Book, 1982, Ministry of Transportation and Communication, Toronto, Ontario.

separate transit commissions and three were conducted through the existing public utilities commission which also provide water and electricity. For the separate transit commissions, between 55 and 60 per cent (on average) of operating costs were offset by operating revenues while the corresponding figures for municipal departments were 40 to 45 per cent and for public utility commissions around 50 per cent. Once again, there was some variation in the proportion of costs captured by operating revenues, although less than for those communities of fewer than 50,000 people. In considering the variation by organizational type in this population range, it is difficult to observe any trends; for example, in the 50,001 to 100,000 range, the variation in percentage of costs recovered was lower for municipal department operations vis-à-vis transit commissions while the opposite was observed for the 100,001 to 200,000 range.

The largest transit systems (over 200,000 population) on average, utilized their operating revenue to recover more than 60 per cent of all operating costs. However, those services provided in municipal departments recovered about 50 per cent of costs while those provided in transit commissions recovered 68 per cent, a noticeable difference.

In total, privately contracted out services (on average) recovered 37.5 per cent of operating costs from operating revenue while municipal departments recovered 41.2 per cent and separate

transit commissions and public utilities commissions recovered 60.3 and 48.8 per cent respectively. Overall, more than 43 per cent of all operating costs were recovered.

In essence, the organizational structure appears to have some bearing on the extent to which municipalities attempt to use fares to recover operating expenses.

Ignoring the organizational differentials for the time being, the fact that smaller communities tend to generate lower revenue to operating cost ratios is not surprising, given the way in which provincial subsidies for operating municipal transit services are structured. These municipal transit subsidies, administered by the Ministry of Transportation and Communications, are allocated among the province's municipalities according to a formula where the grant varies inversely with the size of the municipality's population.

For example, Table 3-9 illustrates the population groups, the target revenue/cost ratios and the resulting fixed rate of basic operating subsidy eligible from the province. Under the existing formula, for instance, a city in the under 100,000 range is assigned a revenue/operating cost ratio of 50 per cent, that is, it is anticipated that this city should be able to cover from operating revenues, at least 50 per cent of its operating costs. The province funds 25 per cent of the operating cost (defined as

Table 3-9

Basic Operating Subsidy from Provincial Government (Ontario)

Population Groups	Revenue/ Operating Cost Target	Target Deficit as a Per Cent of Operating Cost	Basic Provincial Subsidy as a Per Cent of Operating Cost
		(Per cent)	
0 - 100,000	50	50	25
100,001 - 150,000	55	45	22.5
150,001 - 200,000	60	40	20
200,001 - 1,000,000	65	35	17.5
1,000,001 and over	72.5	27.5	13.75

Source Obtained from Ministry of Transportation and Communication, Toronto, Ontario.

50 per cent of the targeted deficit), with the municipality covering the remainder from general revenues. As the city size increases, the provincial subsidy declines so that the maximum subsidy for a city between 200,001 and one million population, for instance, is 17.5 per cent of operating costs. Moreover, the provincial subsidy is fixed because it is based on a targeted deficit rather than actual deficit. Thus, if a municipality is able to reduce its deficit below the targeted deficit, then its share of the subsidy burden is reduced by a corresponding amount. If, on the other hand, its deficit is higher than the targeted deficit, then its contribution will increase correspondingly. It is interesting to note that only nine of the 50 municipalities included in the 1982 sample achieved or exceeded the revenue/operating cost target ratio.[34]

Additional or special operating subsidies are provided to alleviate service impacts associated with rapid population growth and/or implementation of new major transit facilities and to cushion the burden where actual net operating costs are higher than targeted net operating costs. The total operating subsidy payable, when all of these are combined (that is, basic subsidy plus additional or special subsidies) shall not exceed 75 per cent of actual operating costs. In fact, this is effectively the only limit which provincial governments place on the subsidy program.

Finally, to be eligible to receive provincial transit subsidies, a municipality must operate by itself, or through a commission or private contractor, a transportation service on a fare basis to the public. These subsidies are specifically earmarked for the support of municipal transit services and cannot be diverted to fund other municipal services. To guarantee that this happens, provincial auditors periodically check the municipal transit accounts to ensure that conditions for receipt of the subsidy are met.

Although the provincial government contributes large sums to offset part of the operating deficit, they have no say in or control over the size of the local transit system's operating deficit nor do they contribute to the establishment of a fare policy. Controls of this type are not deemed necessary because the municipal government almost always incurs a large subsidy burden and therefore, has a strong incentive to ensure that the service is being supplied in a cost efficient manner. In fact, local council is responsible for approving the budget of the local transit authority regardless of the type of organization under which transit services are supplied. This approval appears to give the local council effective control over the financial and operational side of the transit system. As well, audited financial statements and in some instances, an annual report, are submitted to local council.

Most discussions arising from the budgeting and financial statements revolve around the size of the operating deficit and various ways in which it might be reduced. On occasion this has led to allegations about the inefficiency existing in the management of the local transit system.[35]

Concern over the size of the operating deficit has generated some discussion of fares which should be charged to local users. Needless to say, there are various factors to consider in establishing a fare policy including the availability of and access to substitute forms of transportation, the ability of local residents to pay for transit services, the attitude of local politicians towards the level of acceptable fares, the portion of operating cost to be recovered from fare revenue, etc. While pin-pointing precise determinants of fare structures and absolute rates is not possible, the tendency in almost all communities is to have different fares for different categories of users[36] (in only two of the 49 municipalities surveyed were the fares the same for all users). Table 3-10 lists the average fare by size of municipality and by the organization responsible for providing the service. Given that the percentage of operating costs recovered from provincial subsidies is higher for small communities, it is not surprising to note that average fares are lower for these municipalities. Table 3-10 also indicates that the variation in average fares amongst municipalities within each population group

Table 3-10

Variation in Average Fares by Passenger by Size of Municipality and by Organization Responsible for Providing Local Transit Services, 1982 (Ontario)

Size of Municipality	Contracted to Private Sector			Municipal Department			Transit Commission			Public Utilities Commission			Total		
	Av. ¢	S.D. ¢	C.V.	Av. ¢	S.D. ¢	C.V.	Av. ¢	S.D. ¢	C.V.	Av. ¢	S.D. ¢	C.V.	Av. ¢	S.D. ¢	C.V.
0 - 25,000	40.6	16.2	.40	54.1	9.2	.17	-	-	-	-	-	-	44.8	15.7	.35
25,001 - 50,000	37.5	8.2	.22	48.0	12.2	.25	52.8	-	-	47.6	-	-	42.2	10.6	.25
50,001 - 100,000	31.8	-	-	46.4	7.4	.16	42.8	4.5	.11	47.2	3.3	.07	44.4	7.3	.16
100,001 - 200,000	-	-	-	47.3	3.8	.08	50.9	10.0	.20	47.7	-	-	48.4	6.2	.13
200,001 and over	-	-	-	59.0	7.6	.13	51.3	1.6	.03	-	-	-	54.4	6.0	.11
Total	38.8	13.1	.34	49.8	9.2	.18	48.5	7.1	.15	47.4	2.8	.06	45.5	11.5	.25

Av. = Average fare per passenger
S.D. = Standard deviation
C.V. = Coefficient of variation

Source Calculated from data in Ontario Urban Transit Fact Book, 1982, Ministry of Transportation and Communication, Toronto, Ontario.

for all organizations aggregated is noticeably higher for small communities.

A separation of fares according to organizational responsibility indicates that privately contracted services, on average, exhibited absolute fares which were roughly 10 cents per passenger lower than for the other organizational structure whose average fares were almost identical. However, it must be cautioned that the variation in the average fare structure is much greater for privately contracted firms. Here, the coefficient of variation was .34, whereas, it ranged between .18 and .06 for the other operations.

While a quick comparison of Tables 3-8 and 3-10 suggests there may be positive and significant correlation between average revenue/operating cost ratios and average fares by size of municipality, considerable variation exists within each population group.

To test for the significance of this correlation by including data on every municipality, Table 3-11 presents a series of correlation coefficients between average fares per passenger and revenue/operating cost ratios. None of the population groups by themselves exhibits a significant correlation between average fares and revenue/operating cost ratios for the transit systems within that group. In fact, for both the under 25,000 and over

Table 3-11

Correlation Coefficients between Revenue/Operating Cost Ratios and Average Fares per Passenger by Municipality Size and by Organizational Structure, 1982 (Ontario)

Municipality Size	Contracted to Private Sector	Municipal Department	Transit Commission	Public Utilities Commission	Total
(1)	(2)	(3)	(4)	(5)	(6)
0 - 25,000	-.23	+.60	-	-	-.26
25,001 - 50,000	+.61	-.50	-	-	+.44
50,001 - 100,000	-	+.60	+.50	-	+.58
100,001 - 200,000	-	+.40	-	-	+.21
200,001 and over	-	-	+.50	-	-.30
Total	+.06	+.30	+.47	+.80	+.33*

* Denotes significance at .05 level.

Source Calculated from data in Ontario Urban Transit Fact Book, 1982, Ministry of Transportation and Communication, Toronto, Ontario.

200,000 population groups, the correlation coefficient for all systems within each group displays a negative sign, this is contrary to our hypothesis. Similarly when the systems are separated by organizational structure (last line of columns 2 to 5 in Table 3-11), the correlation coefficients for all municipalities within each organizational group are positive but insignificant at the 5 per cent level. In fact, the only cell in Table 3-11 recording a significant and positive correlation coefficient is that which aggregates all transit systems regardless of governing structure and compares average fares with revenues/operating cost ratios from the smallest community to the largest community. In this instance, our hypothesis is supported, that is, there is a positive and significant relationship between the average fares and the percentage of operating costs recovered through operating revenues.

Having noted that the Ontario government imposes no controls over the operating budgets of local public transit systems, it must be mentioned that provincial authorities do exert considerable control over capital expenditures. This policy of highly subsidizing the purchase of transit capital assets was initiated in the early 1970s to assist municipalities in upgrading their transit fleet and constructing appropriate maintenance and terminal facilities. Eligible assets include the purchase of urban transit vehicles, the refurbishing or restoration of diesel transit vehicles, major rebuilding or remotoring of streetcars,

land and buildings for transit terminals, administration and operation, purchase of service vehicles, and purchase and installation of roadside passenger shelters, etc.

Before this subsidy will be paid on any eligible capital purchase, the need for the item must be justified and the approval of the Ministry of Transportation and Communciation must be secured prior to any municipal commitment. This approval is made only if the municipality follows the standard purchasing practice of preparing a tender package, including precise specifications for the asset to be acquired. All tender documents must be approved by the Minsitry's Transit Office before the call for tenders is issued by the municipality. Once opened, a copy of all tenders received must be forwarded to the Ministry. Ministry policy is to subsidize, at the rate of 75 per cent, the lowest tendered price of the capital asset that meets the municipality's specifications.

Amongst other things, Table 3-8 recorded the organizational structure, in total and by population size, for 49 transit systems in Ontario for which information was collected in 1982. Of these four governing types, contracting out to the private sector was the most common form in municipalities with less than 50,000 people (16 systems fell in this group). Operation through a department at city (town) hall dominated the organizational structure in communities of more than 50,000 people.

For municipalities contracting out the provision of transit services to the private sector, the municipality tenders for bids and in the tender package, local authorities specify a number of things including route length, frequency of service, daily hours of service, maintenance level, fare structure, etc. Occasionally, some of these items may be negotiated (between the contractor and local officials) before the final bid is submitted.

In addition, some of the muncipalities who contract out their local transit services buy the necessary capital equipment with the assistance of provincial capital subsidies and then, rent this equipment to the private contractor. In other communities, the private contractor owns his own equipment (purchased without provincial assistance). This latter operation, although not as common as the former, exists where contractors wish to use the equipment for charter or private transit services in hours when it is not required for local public use.

Where municipalities provide transit services through a municipal department, locally elected councillors are responsible for this service just as they are responsible for many other services provided under their jurisdiction. As distinct from some other municipal services provided through city hall, transit is required, however, to provide an annual budget for council's approval and detailed financial statements, and in some communities an annual report, at year-end.

Separate transit commissions are third most important in terms of the number of municipalities employing this structure. In these instances, locally appointed commissioners assume responsibility for making decisions on transit services; however, local council has reasonable control over the commissioners' decisions because council must approve the transit budget and fare structure, etc. before they can be enacted. Appointment of these commissioners is at the discretion of municipal council, with the mayor frequently being an ex officio member. As well, one or two councillors are frequently appointed as commissioners to ensure some continuity between the commission and local government's other activities.

Finally, four muncipalities provide transit services through the existing public utility commission. In each of these cases, the commissioners are elected and are responsible for the provision of water and electricity as well.

In summary, local public transit displays the greatest variation in the type of organizational structure governing its provision. As well, it is distinguished from water and electricity because of the large operating deficits and relatively large capital subsidies received from provincial authorities. Finally, on the operating budget, it is similar to water provision in that no provincial controls are exerted although local council have more control over the provision of this service than water because of

the requirement to approve annual transit budgets prior to subsidizing the transit operation. For capital asset expenditures, transit purchases are closely controlled and scrutinized by the provincial government. In this instance, the level of control is similar to the control which Ontario Hydro has over local electric utilities.

Evaluation -- While there is considerable variation in the proportion of local transit operating costs covered by operating revenues (mainly fare revenue), extensive subsidization from provincial and local governments does exist. As to whether or not local authorities are recovering the correct proportion of their local budgets in this way is a question of considerable scope. Clearly, the answer depends on the extent to which local governments wish to encourage public rather than private transport. This, in turn, is related to such issues as local development, use of downtown areas for parking lots and urban sprawl.

The current subsidization policy (part from the province and part from the municipality), it has been argued, is unlikely to be allocatively efficient. Subsidies, for example, are paid to cover operating deficits and as long as operating revenues and costs differ from social benefits and social costs as they are almost certain to do, then resources are not being used in their most efficient manner.[37] Clearly, deviation between actual revenue and

costs and social revenue and costs should be considered in designing a subsidy policy.

Basic fare structures in Ontario municipalities tend to be similar, although the absolute levels charged vary. Fixed rates are set for adults with lower rates frequently established for senior citizens, students and children and discounts often available for quantity purchases. This current fare structure creates some economic problems both in terms of what it does and what it does not do. On the one hand, failure to charge higher prices in peak hours in order to reduce the demand at this time and to encourage usage during off-peak hours has often been noted. This emphasis on the same fare structure regardless of the time of day travelled may have generated an overexpansion and greater capacity than can be justified on efficiency grounds. On the other hand, higher peak-load fares can lead to a greater use of private autos, a result that for other socio-economic reasons may be undesirable. Perhaps what is needed is some experimentation to find an optimal policy mix which may lead to an allocatively more efficient level of local transit (public and private) services.[38]

Given that the marginal cost of carrying a rider tends to vary with distance travelled, the failure to use zone charges, as is frequently the case in many municipalities, in order to cover the added cost makes little economic sense. Furthermore, lower rates for senior citizens and students vis-à-vis other riders may be

difficult to justify especially at times when transit systems are overused (peak-hours). Subsidies supplied on the basis of age or status and completely unrelated to income are difficult to support on efficiency grounds.

Finally, the variations in the organizational structure responsible for overseeing the provision of urban transit services is more wide-ranging than for either water or electricity. Whether or not the specific organizational structure has any bearing on pricing and investment decisions is worth noting. Unfortunately, many of these comments may be tentative; for there is really no information available on institutional traits associated with these alternative structures which may affect pricing and investment decisions. While Table 3-10 indicates that average fares tend to be lower in privately contracted vis-ă-vis other organizational modes, this observation is likely to be attributed to relatively lower operating costs under this organizational structure (see Chapter 4). Further support for this observation is derived from Table 3-8 (first 2 rows under municipal department and contracted services) when, not only are average fares lower in the contracted out service, but the percentage of operating costs, on average, covered by operating revenues, is higher.

The process of fare setting tends to be similar in every municipality. Transit authorities, with a reasonable degree of

accuracy, estimate their upcoming annual operating costs. Since each municipality is given a targeted revenue/operating cost ratio (Table 3-9), it is left with designing a fare structure which will generate the revenues necessary to achieve this target. In some instances, local authorities may deliberately set fares to generate revenues which are below or above the targeted level (this would lead to greater or lower subsidies from the municipality). This is likely to depend on the political climate at the time and the attitude of local officials. However, the setting of fares to generate other than targeted revenues appears to be random across the various organizational structures. There is no evidence to suggest that a particular structural mode leads to a specific type of behaviour in either fare setting or investment decisions.

Notes

1 While these are not meant to be all inclusive, they do reflect the major variation which exists.

2 For a discussion of this, see "Local Government and Canadian Federalism," by Harry Kitchen and Mel McMillan, mimeo. 1984, a paper prepared for the Royal Commission on the Economic Union and Development Prospects for Canada.

3 For an elaboration of this principle of public prices, see Bureau of Municipal Research, Municipal Services: Who Should Pay?, Topic No. 13, Toronto, BMR, 1980, pp. 33-42: Selma J. Mushkin and Richard M. Bird. "Public Prices: An Overview," in Selma J. Mushkin, ed., Public Prices for Public Products (Washington, D.C.: Urban Institute, 1972), pp. 3-25; and Richard D. Bird, Charging for Public Services: A New Look at an Old Idea, Toronto, Canadian Tax Foundation, 1976

4 R. G. Lipsey and Kelvin Lancaster, "The General Theory of Second Best" (1956), 24 Review of Economic Studies, pp. 11-32.

5 For a further discussion of this, see John F. Due and Ann F. Friedlaender, Government Finance: Economics of the Public Sector, 7th ed. (Homewood, Illinois: Richard D. Irwin, 1981), pp. 93-98.

6 H. Liebenstein, "Allocative Efficiency vs X-Inefficiency," American Economic Review, Vol. 66, June 1966, pp. 392-415.

7 For a more detailed and analytical discussion of the conditions necessary for optimal allocation, see John F. Due and Ann F. Friedlaender, Government Finance: Economics of the Public Sector, 7th ed. (Homewood, Illinois: Richard D. Irwin, 1981), p. 76.

8 Richard D. Bird, Charging for Public Services: A New Look at an Old Idea, Toronto, Canadian Tax Foundation, 1976, p. 70.

9 For a discussion of this, see Water Rates in Ontario: Principles and Practices, Ontario Municipal Water Association and Ontario Section, American Waterworks Association, Toronto, May 1979.

10 Ibid., p. 2-18.

11 The Public Utilities Act - Revised Statutes of Ontario, Chapter 390, Section 27(2).

12 Some federal and provincial grants are available for offsetting a portion of the capital construction costs.

13 Water Rates in Ontario, op. cit., pp. 2-27.

14 For a review of municipal water rates structures in Ontario, in 1983, see 19th Annual Survey of Municipal Water Rates in Ontario, American Water Works Association, Ontario Section, Toronto.

15 Harry M. Kitchen, A Statistical Estimation of a Demand Function for Residential Water. Social Science Series No. 11 (Ottawa: Inland Waters Directorate, Water Planning and Management Branch, Environment Canada, 1975).

16 See 19th Annual Survey..., op. cit., for a description of various rates.

17 Harry M. Kitchen, "A Statistical Estimation of an Operating Cost Function for Municipal Water Provision" (1977), 4 Journal of Urban Analysis 119-33.

18 Richard Bird, op. cit., 1976, p. 120.

19 Paul B. Downing, "User Charges and the Development of Urban Land" (December 1973), 26 National Tax Journal 631-37, at 632.

20 Ibid., pp. 634-37.

21 See Angelo P. Grima, Residential Water Demand Alternative Choices for Management, Research Publication no. 7 (Toronto: University of Toronto, Department of Geography, 1972), p. 189; and Richard Bird, op. cit., 1976, p. 120.

22 The issuance of warnings or imposition of controls has proven to be fairly effective in some municipalities. See supra footnote, 17, at 5.

23 For a discussion of this approach, see J. E. Dickey, "A Guide for Analyzing Local Government Service Pricing Policies" (memorandum) (Blacksbury, VA.: Centre for Urban and Regional Studies, Virginia Polytechnic Institute and State University, 1975).

24 W. A. Niskanen, Bureaucracy and Representative Government, Chicago, Aldine-Atherton, 1971.

25 Louis De Alessi, "An Economic Analysis of Government Ownership and Regulation: Theory and The Evidence from The Electric Power Industry," Public Choice, V. 19, Fall 1974, p. 9.

26 Ibid., p. 8.

27 Calculated from statements B and C, Statistical Yearbook, 1982, Ontario Hydro, Toronto, Canada.

28 Ibid., p. 1.

29 For new developments, charges similar to lot levies or development charges are imposed on the developer to cover the connection costs.

30 For a discussion of the individual utility rate structure, see Monthly Rates and Comparative Bills, Ontario Hydro and the Associated Municipal Utilities, Ontario Hydro, July 1983, Toronto.

31 This definition differs from one employed by the Economic Council of Canada which defines the rate of return as being equal to net autonomous income (net income minus subsidies) plus net interest expense (interest payments minus interest earned) as a per cent of capital employed which is defined as working capital (current assets minus current liabilities) plus net fixed assets. The simple definition used in this paper is employed because accurate data on interest received and interest paid are not available.

32 See L. Courville, "Regulation and Efficiency in the Electric Utility Industry," Bell Journal, Vol. 5, 1974, pp. 53-74.

33. See Water Rates in Ontario, op. cit. and Monthly Rates and Comparative Bills, Ontario Hydro and the Associated Municipal Utilities, annual publication by Distribution and Marketing Branch, Ontario Hydro, Toronto, Ontario.

34 Calculated from data in Ontario Urban Transit Fact Book, 1982, Ministry of Transportation and Communications, Toronto.

35 John Palmer, John Quinn, Ray Resendes, "A Case Study of Public Enterprise: Gray Coach Lines Limited," in Crown Corporations in Canada: The Calculus of Instrument Choice, edited by J.R.S. Prichard, Butterworth, Toronto, 1983, p. 379.

36 For a detailed presentation of the structure and level of fares in each municipality, see Ontario Urban Transit Fact Book, 1982, op. cit.

37 Richard Bird, Charging for Public Services: A New Look at an Old Idea, Toronto, Canadian Tax Foundation, Ontario, 1976, pp. 66-67.

38 Ibid., pp. 64-65.

4 RELATIVE EFFICIENCY OF PROVIDING LOCAL PUBLIC SERVICES

Earlier discussion in this paper has concentrated on a description of the universe of the local government enterprise sector along with a presentation and assessment of the institutional and legal environment within which each of water provision, electrical power and urban transit systems operate. Up to now, nothing has been mentioned about the relative efficiency of providing these local services through various organizational alternatives. In fact, the current climate of concern over the possibility of lowering the costs of providing public services at every level of government has dictated the necessity of discussing possible ways in which these costs may be reduced in the provision of local services.

Efficiency gains may arise in two ways. First, a reorganization of the inputs (to achieve greater output with the same per unit costs or the same output with lower per unit costs within the existing firm) employed within the existing organization responsible for supplying the service may lead to improvements in technical efficiency. To evaluate this issue, one needs considerable detail on the various costs internal to the firm and a good deal of detailed engineering data on each producing unit.

Since these data are not available, no discussion of the way in which improvements in technical efficiency may be achieved will be pursued in this paper.

The second type of efficiency and the one discussed here will concentrate on improving the allocative efficiency of providing local services. As such, this discussion will evaluate the relative efficiency of providing local government services through alternative organizational modes. The possible structures (producing or distributing firms) to be evaluated consist of public versus private provision and local government department as opposed to separate commission for services which are to be provided by the local government sector itself.

Before proceeding with this comparison, it should be noted that the following discussion will not advocate the introduction of more than one producing unit to provide an existing local service within a specific geographical area or a local community. For example, to have more than one local electric power utility, each with its own transmission and distribution network, or to have more than one firm providing water from its own purification plant and transmitting its output through separate water mains or to have more than one urban transit system covering the same geographical area is likely to lead to unnecessary duplication and unwarranted infrastructive costs, create more congestion and negative externalities and hence, impose excessive social costs on

the local citizens. Therefore, the issue is not one of advocating the introduction of more producing or distributing firms to secure a more competitive environment, rather it is one of choosing the proper producing unit with its inherent legal and institutional framework which will generate the best approximation of the competitive output and pricing decisions (discussed in the preceding chapter). If this can be achieved, society will benefit by securing the greatest possible benefits.

Public Versus Private Provision

There is a body of literature which has compared the relative efficiency of public versus both regulated and unregulated private provision of a number of government services,[1] a few of which are provided by local governments (refuse collection is the most commonly studied local government service for this purpose, although it does not fall under the local government business enterprise heading) and/or their business enterprises.

Unfortunately, almost all of the evidence on comparative costs of local government services is drawn from studies in foreign countries, primarily the United States, where there is or has been sufficient variation in the organizational mode to provide for a statistical comparison of the alternative costs of public versus private provision. In Canada, variation in public versus unregulated private provision of local government services is

generally non-existent. Hence, no empirical analysis has or can be conducted on this comparison at the local government level.

Table 4-1 records, briefly, the conclusions reached in a number of studies dealing with the relative efficiency of providing electrical power and water through two alternative organizational modes, specifically the public sector and the private sector. From these results, there is no clear consensus as to which sector is more efficient in the provision of electricity. Three of the five studies dealing with water provision conclude that the private sector is less costly while a further study is unable to observe any cost difference between public and private provision. The fifth study notes that privately regulated provision is more expensive than municipal government provision. Indeed, if one were to review the results of studies on local government services beyond the local government business enterprise sector (such as refuse collection and fire protection, for example), one would find that most of these have concluded that private sector provision is more efficient and less costly.[2]

Without providing a detailed <u>a priori</u> basis for explaining why public firms behave differently than private firms, it has been suggested that this difference has a theoretical basis in one or both of the "property rights" approach and the "public choice" approach to the theory of the firm.[3]

Table 4-1

Extant Studies on the Relative Efficiency of Private Versus Government Enterprise Provision of Selected Services

Local Government Service	Author	Organizational Comparison	Findings
Electric Utilities:	Meyer, R.A. (1975)	Sample of 60 to 90 U.S. public utilities, versus private firms	Weak indication of higher costs of private production.
	Moore, T.G. (1970)	Sample of U.S. utilities: 27 municipal versus 49 private firms	Overcapitalization greater in public firms. Total operating costs of public production are higher.
	Neuberg, L.G. (1977)	Sample of 166 to 324 municipality versus privately owned utilities	Higher operating costs associated with private production.
	Spann, R.M. (1977)	Four major U.S. cities/public (San Antonio, Los Angeles) vs. private (San Diego, Dallas) firm	Private firm, adjusted for scale, as efficient and probably more so with respect to operating costs.
	Wallace, R.L. and Junck, P.E. (1977)	By regions in U.S./public versus private firms	Operating costs 40 to 75 per cent higher in public mode.
Water Utilities:	Crain, W.M. and Zardkoohi, A. (1978)	112 U.S. firms/municipal versus private suppliers: case study of two firms who each switched organizational form	Public firms 40 per cent less productive with 65 per cent higher capital-labour ratios than private equivalents; public firm that became private experienced an output per employee increase of 25 per cent. Private firm that became public experienced an output per employee decline of 40 per cent.
	Mann, P.C. and Mikesell, J.L. (1976)	U.S. firms/municipal versus private suppliers	Replicates Meyer's electricity model, but adjusts for input prices. Found public structure more expensive by 20 per cent.

Table 4-1 (cont'd.)

Local Government Service	Author	Organizational Comparison	Findings
Water Utilities: (continued)	Morgan, W.D. (1977)	143 firms in six U.S. States/ municipal versus private supplier	Costs 15 per cent higher for public firms.
	Bruggink, T.H. (1982)	U.S. firms/municipal versus rate of return regulated private utilities	Found government ownership to be 24 per cent less costly than private firms.
	Feigenbaum, S. and Teeples, R. (1983)	U.S. firms/comparison of the costs of water delivery for government versus private utilities	No significant differences in the costs of government versus private operations.

Source All but one of these are selected from a more detailed list of public versus private provision studies in "Comparing the Efficiency of Private and Public Production: The Evidence from Five Countries," by T. E. Borcherding, W. W. Pommerehne, and F. Schneider in Journal of Economics, by Springer-Verlag, 1982, pp. 130-33. The original articles are listed here: R. A. Meyer (1975), "Publicly Owned Versus Privately Owned Utilities: A Policy Choice," Review of Economics and Statistics 57, pp. 391-99; T. G. Moore (1970), "The Effectiveness of Regulation of Electric Utility Prices," Southern Economic Journal 36, pp. 365-75; L. G. Neuberg (1977), "Two Issues in the Municipal Ownership of Electric Power Distribution Systems," The Bell Journal of Economics 8, pp. 303-23; R. M. Spann (1977), "Public Versus Private Provision of Government Services," in T. E. Borcherding (ed.), Budgets and Bureaucrats: The Sources of Economic Growth, Durham, North Carolina, pp. 71-89; R. L. Wallace and P. E. Junck (1970), "Economic Inefficiency of Small Municipal Electric Generating Systems," Land Economics 46, pp. 98-104; Wm. M. Crain and A. Zardkoohi (1978), "A Test of Property Rights Theory of the Firm: Water Utilities in the United States," Journal of Law and Economics 21, pp. 395-408; P. C. Mann and J. L. Mikesell (1976), "Ownership and Water Systems Operations," Water Resources Bulletin 12, pp. 995-1004; W. D. Morgan (1977), "Investor Owned Versus Publicly Owned Water Agencies: An Evaluation of the Property Rights Theory of the Firm," Water Resources Bulletin 13, pp. 775-82; Thomas H. Bruggink (1982), "Public Versus Regulated Private Enterprise in the Municipal Water Industry: A Comparison of Operating Costs," Quarterly Review of Economics and Business, Vol. 22, No. 1, pp. 111-25; and Susan Feigenbaum and Ronald Teeples (1983), "Public Versus Private Water Delivery: A Hedonic Cost Approach," Review of Economics and Statistics, Vol. 65, pp. 672-78.

The "property rights" theory,[4] in essence, attributes the difference in efficiency (per unit costs) to the ownership of the producing unit. This theory concentrates on the relative ease of transferring ownership rights in private firms and the difficult, if not impossible task of transferring ownership rights in public firms. In the former, the market for ownership shares serves to facilitate this task; whereas in the latter, no such mechanism exists. Transfer of shares in public firms can only occur if the citizen changes residence or if the government legislates changes which alter the taxes paid for services provided. This relative ease of transferability in private firms, on the other hand, tends to lead to a concentration of ownership in the hands of a comparatively small number of people who have direct supervisory control over their hired managers and their decisions. This, in turn, may lead to lower monitoring costs through actions, such as removing the manager from his position if the firm is not maximizing its wealth or through such schemes as tying the manager's pecuniary income to the firm's profit position or asset value.

The owners of public firms (citizen-taxpayers), by comparison, incur high costs of transferring their ownership rights, because these rights are not traded in organized capital markets (where the market value of shares can serve as a useful indicator of the manager's ability to maximize owner's wealth). As well, public managers are not allowed to share directly in the profits nor hold

ownership rights in the firm. Finally, citizen-owners have no direct supervisory control over public managers. They can exert their influence through public intermediaries only. Thus, monitoring costs become fairly expensive especially when the potential gains are distributed to everyone (while the costs may be incurred by only a few).[5]

In essence, this theory concludes that greater incentives are provided to private vis-à-vis public managers because of the relative ease of transferring ownership rights and the lower costs associated with monitoring management decisions in the private sector. Hence, it is concluded that public managers will be less concerned with organizing input decisions so as to maximize the wealth of the owners (citizens) and hence be less efficient.

The "public choice" approach coincides in some ways, with the "property rights" approach except that the former emphasizes the lack of competition in the public when compared with the private sector. In the public choice literature,[6] the emphasis is on bureaucracies and the incentives or lack of incentives which are dominant in affecting the decisions made by bureaucrats. Briefly, it is argued that bureaucrats are more interested in maximizing their own utility than that of the citizen-owners. This consists of seeking higher pay, securing more power and gaining more prestige, objectives which are highly correlated with the size of the public firm's budget. As a result, there is a tendency to

expand the public operation beyond the point where the additional benefit of the last unit produced equals the additional cost of the last unit produced, or in other words, beyond the point where the private firm would maximize its owners' wealth.

This tendency for decision-makers in public firms to expand their programs beyond levels adopted in the private sector is possible because the bureaucrats (decision-makers) may "join with those in the legislature who find such excess supplies congenial to their constituents' interests."[7] This oversupply of a number of services will lead to an inefficient allocation of society's resources and higher per unit costs in the provision of many of these services than can otherwise be justified.

Having provided a theoretical basis for observing the differences in the relative efficiency of the public and private sector provision of some local government business enterprise services, one notes that there is no unregulated or uncontrolled private provision of major local government services in Canada. Hence, any empirical investigation of the differences in costs arising from these alternative organizational modes is impossible. On the other hand, as a subset of this public versus private sector comparison, one can observe the difference in costs associated with the provision of a service through a local government business enterprise versus the provision of the same

service by a private firm contracted by the local government or its representative agency.

There are two local government enterprise operations or parts of their operations where 'contracting out' is used by a number of municipalities. These include the entire provision of urban transit services in some Ontario communities and the contracting out for all maintenance and repair expenditures in a number of local electrical utilities in Ontario.[8] In each of these instances, the contracts signed will specify certain conditions which must be met. For urban transit, route design, frequency of service and fare structures are stated (although frequently after some negotiations between the contracting parties); whereas, for repair and maintenance of electrical utilities, much of the work is done on a fee for service basis.

Privately Contracted Versus Publicly Provided Services

Municipalities, including and excluding the municipal government enterprise sector, have had a long history of contracting a number of construction projects including buildings, water and sewage lines and certain professional services such as engineering design and legal advice, from the private sector. Indeed, given the haphazard occurrence of these expenditures, it can be argued that private sector provision is less costly since these inputs are

simply purchased for the duration of time required to complete the project and not funded when not required.

For municipal services providing a final output (refuse collection, snow removal, police and fire protection) definitive statements on the organizational mode responsible for delivering the service in the most efficient manner are difficult to obtain. Some evidence, however, has been emerging on both the utilization and efficiency of private sector provision of a number of local services.[9] In the only previously published study on municipal refuse collection in Canada,[10] it was observed, after the elimination of all other variables affecting per unit costs, that a refuse collection system operated directly by the municipal government was significantly more expensive than a private operation (contracted out by the local government) providing the same quantity and quality of service. In reality, this tends to occur because local governments, lacking competition, seldom have any index by which to measure efficiency and performance. In fact, even if this index were available, there may not be much incentive to improve on, let alone maintain, efficiency. All of this, when combined with the fact that revenues are not keyed to output, undoubtedly make the municipal operation a more costly venture.[11]

Although refuse collection is not in the domain of the local government business enterprise sector, it does provide us with

some indication of the relative efficiency of the organization responsible for providing a local service. Further evidence on the way in which the organizational structure affects per unit costs within the government business enterprise sector can be extracted from the results of studies on two separate local government enterprise services in the province of Ontario. These are reported below and include the provision of urban transit and the contracting out of the maintenance and repair function in the local provision of electric power.

Urban Transit

Arguments as to whether urban transit should be provided directly by municipal governments as opposed to being contracted out to the private sector may revolve around a number of points; however, perhaps the most significant component of this argument involves a comparison of per unit costs under alternative organizational modes. This comparison is attempted here through the use of a linear regression equation which employs average operating cost per capita as the dependent variable and a number of factors, including organizational mode (local government versus privately contracted) as independent variables.

This attempt to measure the statistical importance of a number of factors affecting per unit operating costs differs from classical production/cost theory. Classical theory describes a single

firm producing an output or separate outputs with a number of paid inputs given a fixed state of technology. In cross section econometric analysis, by comparison, one faces observations from a number of producing agents and consequently, variation in a number of factors which can contribute to different per unit costs. To obtain a homogeneous unit of output which is necessary for cost analysis, variations attributed to quality, quantity and service conditions across producing units must be controlled. Hence, the following analysis measures the statistical importance of a number of independent variables on the average operating cost per capita for 43 municipalities in Ontario in 1982 and 1983 respectively.[12] Metropolitan Toronto was excluded from this analysis because the nature of its service (subways) is noticeably different from the remaining centres.

Perhaps a few comments about the choice of per capita rather than per passenger costs is appropriate at this point. Given that the choice of organizational mode (one of the independent variables) may affect decisions on other quality (hours of service, frequency and location of pickups, number of maintenance employees, etc.) and quantity (passengers carried) variables, all of which are included as independent variables, an attempt to evaluate the statistical significance of each of these independent variables on average operating cost per passenger may generate problems of multicollinearity; that is, the choice of the organizational mode may dictate the values for the other independent

variables including hours of service, frequency of pickups, number of maintenance employees and passengers carried, etc. In essence, more than one independent variable may be capturing the same effect. To avoid this problem, the model adapted in this study selected as the independent variables, those over which the organizational structure (which is one of the independent variables) had little or no choice or control. For example, the type of organization is unlikely to have any effect on population or population density. Similarly, there is no a priori basis for assuming that the organization structure will affect the price of inputs. The model formulated, then, measures the average operating cost per capita as a function of population, population density, price of inputs and type of organizational structure responsible for providing the transit service.

The amount or quantity of the service is measured by population in 1982 and 1983. The use of this output variable allows one to test for the prevalence of economies of scale in the provision of urban transit services. Since there is no a priori basis for expecting economies to occur, we are simply attempting to test for their existence or lack of existence.

The other independent variables[13] were anticipated to have a specific effect on operating costs per capita. For example, the more densely populated the municipality, the greater the number of riders per trip and hence, the lower the per unit cost.[14]

Obviously the price of inputs is felt to have a significant effect on the per unit cost of the service. For this study, labour is the only input for which a price can be obtained. Consequently, it is assumed that the higher the per unit price of labour,[15] the higher the average operating cost of the service.

Finally, the most important variable to be tested for the purpose of this study[16] is that which compares the effect on per unit operating costs of providing this service through different organizational modes. In reality, there are three different organizational structures existing in Ontario. These include provision through an arrangement whereby the municipality contracts with some firm in the private sector to provide this service; provision through a municipal department; and provision through a separate transit commission.

While there is no theoretical basis for predicting the direction of the signs associated with each of the two variables measuring the importance of the organizational structure, there are some hypotheses which can be explored. First, in comparing privately contracted (with the municipality) with publicly provided transit services, it has been argued that equal efficiency in a technical sense for both municipal and private provision may lead to per unit cost differences. This may arise because the publicly run operation is free of the incentive to earn profits and hence,

public provision is cheaper over a given range of output. On the other hand, a municipal operation, lacking a competitive environment, may have no yardstick by which to measure technical efficiency and performance and hence may be more costly than a corresponding private operation. The sign associated with the coefficient for this variable will indicate which organizational mode is more expensive.

Second, in comparing the provision of transit services through a municipal department versus the provision through a separate transit commission, it has been suggested that municipal department provision will be less costly because of greater pressure towards public accountability and an ability to benefit from circular integration with the other functions performed by city hall. A negative sign associated with this coefficient supports this hypothesis.

An examination of the individual independent variables (Table 4-2) reveals the expected sign for each of the significant variables with the exception of private versus municipal operation for which there was no expected direction.

While economies of scale did not appear to exist in the provision of this service, diseconomies as measured by population squared was statistically significant at the .025 level in 1982

Table 4-2

Statistical Significance of a Number of Factors Affecting Operating Costs Per Capita for Urban Transit Services in Selected Ontario Municipalities* in 1982 and 1983

Independent Variables	1982 Coefficient Value	1982 T-Statistic	1983 Coefficient Value	1983 T-Statistic
Population	3.172-05	.477	-1.167-05	-.156
Population squared	2.983-10	2.199**	4.050-10	2.765***
Price of labour	1.418	.595	2.609	1.054
Population density	-.394	-.686	-.624	-.999
Private provision vs. provision by transit commission	-13.295	-2.088**	-13.955	-2.077**
Municipal department vs. provision by transit commission	-5.737	-1.194****	-7.059	-1.289****
Adjusted coefficient of determination ($\bar{R}^2$)	.723		.743	
F-statistic	19.236		21.257	
Sample size	43		43	

* A small number of communities in 1982 were replaced by other communities in 1983. In each year the final selection of communities depended on the number for which data were available and reliable.

** Significant at .025.
*** Significant at .005.
**** Significant at .15.

Source Calculated from data in the Urban Transit Fact Book for 1982 and 1983, a joint publication of the Ontario Ministry of Transportation and Communications and the Ontario Urban Transit Association, Toronto, 1982 and 1983.

and at the .005 level in 1983, thus suggesting that per unit costs increase by a significant amount as population increases.

Both the price of labour and population density displayed no statistically significant effect on per unit costs.

For the purposes of this paper, the two variables in which there is the greatest interest are those measuring the importance of the organizational mode on per unit costs. Provision by a privately contracted body is significantly less expensive than provision by a local transit commission. In fact, these results are statistically significant at the .025 level. If the critical level of significance is lowered to .15, then provision by a municipal department is observed to be less expensive than provision through a transit commission, a result which was expected prior to testing the model.

Overall, this model explains over 72 per cent of the variation in per unit costs in 1982 and more than 74 per cent in 1983.

Table 4-3 provides results when only three independent variables are employed, specifically population and population squared to test for economies and diseconomies of scale and private versus public provision.[17] The remaining variables were dropped from this model because they were insignificant at the 10 per cent level. While the overall explanatory power increased marginally,

Table 4-3

Statistical Significance of Public Versus Private Provision of Providing Urban Transit in Selected Ontario Municipalities* in 1982 and 1983

Independent Variables	1982 Coefficient Value	1982 T-Statistic	1983 Coefficient Value	1983 T-Statistic
Population	3.994-05	.659	8.198-06	.130
Population squared	2.921-10	2.249**	3.879-10	2.901****
Private vs public provision	-11.642	-2.477***	-13.090	-2.659****
Adjusted coefficient of determination ($\overline{R}^2$)	.731		.746	
F-statistic	39.088		42.085	
Sample size	43		43	

* This model deletes all of the insignificant variables reported in Table 4-2 except for population squared. The communities included here are identical to those in Table 4-2.

** Significant at .025.
*** Significant at .01.
**** Significant at .005.

Source Same as Table 4-2.

provision by a private supplier (contracted by the municipality) was significantly cheaper than provision of a virtually identical service by the local public sector (municipal department or transit commission). In fact, this variable was significant at the 1 per cent level in 1982 and at the 0.5 per cent level in 1983.

Electricity

While local electric utilities have no control over a large percentage of their expenses, primarily those associated with the per unit costs of purchasing power from Ontario Hydro,[18] they do have jurisdiction over the remaining expenses including those attributed to the operation and maintenance of the local plant and equipment, billing and collection costs, other administrative and financial expenses and depreciation. In fact, these costs amount on average, to roughly 15 per cent of total operating costs incurred by local electric utilities.

Given this proportionately low percentage of total electric utility operating costs over which the local utility exercises some control, one may question the usefulness of undertaking a study designed to test the statistical importance of a number of variables which may affect the cost of transmitting and distributing electric power within municipal boundaries. In response, one may offer two answers. First, regardless of the magnitude of

these costs, it is still important to test for the significance of factors which may affect service costs, especially since municipalities may need this type of information if they are to improve the allocation of resources over which they have some control. Second, and more specifically, statistical significance of specific factors affecting service costs for electric power may shed light on possible factors affecting the cost of providing other local government services for which data are not available.

To test for the significance of a number of factors, this paper employs a linear regression equation and draws upon data for 324 local electric utilities in the province of Ontario in 1982 and 336 in 1978.[19]

Average operating cost (excluding the cost of power purchased) per thousand kilowatt-hours is the dependent variable. Kilowatt-hours (in thousands) is used as the independent variable responsible for determining whether or not economies exist in the provision of this service. Since there is no a priori basis for assuming that economies exist, one is left to observe the empirical response before commenting on the direction and significance of this factor.

If one constructs a hypothetical example where the same total kilowatt-hours (KWH) are consumed by both the residential and non-residential sector but the consumption per customer is quite

different in these sectors (in 1982, the average consumption per customer in the non-residential sector was eight times greater than the average consumption per customer in the residential sector), then one will notice a difference in total costs incurred by each of these sectors. Higher per unit operating costs, which are attributed largely to greater billing and meter reading expense, will be associated with the residential sector. Hence, the greater percentage of kilowatt-hours sold to the residential sector, the greater the average cost per thousand kilowatt-hours.

Load density is expected to have an effect on per unit operating costs.[20] Once again, if we take two hypothetical communities, each with the same total kilowatt-hours consumed but with a different number of customers, the community with the higher KWH per customer is expected to have lower per unit operating costs because of fewer customers which must be serviced. To test for the significance of the load density variable, we separated KWH into residential and non-residential components and measured the relationship between (i) average operating cost per thousand KWH and KWH per residential customer, and (ii) average operating cost per thousand KWH and KWH per non-residential customer.

Two further variables were included in the regression equation. First, accumulated depreciation as a percentage of the total value of plant and facilities was employed in an attempt to reflect

maintenance and repair costs associated with the age of the capital stock. For instance, the older the facility, the greater the accumulated depreciation and hence, the greater the expense of repairing and maintaining the system. Therefore, a positive relationship between this variable and per unit operating costs was postulated.

Second, a dummy variable was included to test for operating cost differences between those local utilities who employed their own maintenance and repair staff and those utilities who contracted out maintenance and repair services.

As with the variable testing for economies, there is no apparent theoretical reason for expecting one to be more or less expensive than the other. It is an empirical question.

Table 4-4 records the results from the regression equations for 336 local utilities in 1978 and 324 in 1982. Overall, the independent variables explained more than 26 and 36 per cent of the variation in average transmission and distribution costs across local utilities in 1978 and 1982 respectively. The equations also revealed that all independent variables, except for accumulated depreciation as a per cent of the value of total plant and facilities, were significant, although the degree of significance ranged from 10 to 0.1 per cent.

Table 4-4

Statistical Significance of Factors Affecting Average Operating Costs* Per Thousand Kilowatt Hours in Ontario Municipalities in 1978 and 1982

Independent Variables	1978 Coefficient Value	1978 T-Statistic	1982 Coefficient Value	1982 T-Statistic
Kilowatt-hours (in thousands)	-1.738-07	-.457	-5.941-07	-1.429****
Kilowatt-hours squared (millions)	3.663-14	.564	8.941-14	1.309****
Percentage of KWH consumed by the residential sector	.045	4.801**	.063	5.603**
Residential kilowatt-hours (in thousands) per customer	-.196	-5.407**	-.410	-8.267**
Non-residential kilowatt-hours (in thousands) per customer	-5.168-03	-2.593***	-6.889-03	-2.672***
Accumulated depreciation as a per cent of plant and equipment	8.683-03	.998	-6.241-03	-.525
Utility performed maintenance and repairs versus contracted maintenance and repairs	1.214	5.724**	1.676	6.634**
Adjusted coefficient of determination ($\bar{R}^2$)	.26		.36	
F-statistic	18.17		27.02	
Sample size	336		324	

* Average operating costs per thousand kilowatt-hours does not include the cost of purchasing power from Ontario Hydro. It only considers the local utility's costs attributed to operation and maintenance, billing and collecting, depreciation, administration and financial expenses.
** significant at the .001 level.
*** significant at the .01 level.
**** significant at the .10 level.

Source Ontario Hydro Statistical Yearbook for 1978 and 1982, Ontario Hydro, Toronto, Ontario.

The significance (at the 10 per cent level) of KWH and KWH squared for 1982 suggests an optimum (minimum cost) scale of operation exists. This result raises two possibilities. First, reduced operationg costs may be realized by amalgamating a member of the smaller utilities into larger units. Second, similar cost reductions may be achieved by breaking up some of the larger units into smaller producing and administrative units. This possibility of decentralization of local service operations to achieve maximum economies was also suggested in an earlier study on the factors affecting the operating costs of water provision in Canadian municipalities.[21]

The percentage of KWH consumed by the residential sector was significant (at the .001 level) and operated in the predicted manner. The load density variables for the residential and non-residential sectors also had the expected sign and were highly significant (at the .01 level for the residential sector and at the .001 level for the non-residential sector).

While there is no a priori basis for predicting whether an electric utility which contracts out for all repair and maintenance costs will be more or less expensive than a similar utility with its own staff, the results (Table 4-4) suggest that utilities contracting out operate more efficiently (lower per unit costs). Perhaps this is one area where municipalities with their

own maintenance staff may consider changes which would lower operating costs.

Because approximately 180 of these utilities contracted out all repairs and maintenance functions, it was not possible to include the price of labour as an independent variable in the regressions for all utilities. In fact, the wage rate for a journeyman-lineman was available for only those local utilities performing their own repairs and services. To test for the significance of the price of this input, a separate regression (not reported here) was run on those electric utilities who employed their own staff. The price of labour (hourly wage rate for a journeyman-lineman) was included as an independent variable. Even though the rate displays wide variation across utilities, it was highly insignificant and not a factor in affecting per unit costs. The other independent variables (the dummy variable excluded) had the same signs as in Table 4-4 and roughly the same degree of significance. The entire equation also explained the same per cent of variation in per unit operating costs.

Summary

Since the comparative efficiency or inefficiency of publicly provided local services are both conceivable hypotheses, determination of relative efficiency is a matter for empirical

investigation. Unfortunately, data limitations or a lack of variation in organizational modes have restricted the investigations which have and can be conducted in Canada. In an earlier study on refuse collection,[22] significant cost savings were noted in municipalities where this service was contracted out to the private sector. In this study, we have observed similar savings where urban transit is contracted out to the private sector and where the maintenance and repair functions of local electric utilities have been contracted out.

Clearly, greater dependence on 'contracting out' arrangements for many local services, not only those mentioned here, should be considered if one is to attempt to lower the per unit cost of providing local services. For services, where there has been a definite decision to retain their provision within the local public sector, an investigation of the relative costs of alternative organizational modes must be conducted. Possible organizational modes include a local government department versus a separate commission, a comparison which will be addressed in the following section.

Local Government Department Versus a Separate Commission

While various private structures (regulated and unregulated etc.) exist as an organizational vehicle for providing goods and services, variation also exists within the local public sector.

For example, the most dominant alternative in the latter sector is either a local government department or a special commission. In fact, each of these organizational modes exists in the provision of both water and urban transit.

In an earlier study estimating the statistical significance of a number of factors affecting the per unit operating costs of providing water in 49 municipalities (population over 10,000) in Canada,[23] it was observed that the cost of supplying water through a separate water or utilities commission was significantly higher than the costs of supply by a department directly under city council. Since the regression equation netted out the influence of a number of other independent variables including treatment expenses, source of supply, density of water outlets, climatic and topographic variation, factor price, distributional methods, capacity utilization and quantity, it was evident that the organizational structure itself had significantly affected costs. In fact, the T-statistic which emerged for this variable (3.15) was significant at the 1 per cent level. Overall, these independent variables explained more than 72 per cent of the variation in per unit operating costs for water distribution systems.[24]

Earlier in this study, similar results (although only significant at the 15 per cent level) were reported for the provision of urban transit services. More precisely, those centres providing their services through a transit commission tended to be more

costly than those centres where provision was the responsibility of city hall.

Although both studies report that local commissions tend to be more costly, the extent to which these results are statistically significant differs. Part of the explanation for this difference can be attributed to the effective control or lack of control which local councillors and their administrators have over the organizational unit providing the service. For example, in water provision, regardless of whether it is operated by city hall or by a commission, all operating expenses are financed from operating revenues (operating subsidies do not exist); whereas, in urban transit, large subsidies are supplied by local council to offset a large part of the operating deficit even if this service is administered and provided by a separate commission. The provision of a subsidy (transit) partially ensures that councillors and city hall administrators have some interest in and some measure of control over transit budgets. In fact, because of the subsidy, local council must approve the transit system budget regardless of whether transit falls under the jurisdiction of city hall or a separate commission. For water provision operated by city hall, similar council controls exist; however, where water is provided through a separate utility commission, local council effectively has no control over the operation. The higher costs under a commission appear to be the result of weaker pressures toward public accountability and an unwillingness or inability to benefit

from circular integration with other functions performed by municipal council.[25] Taking these in order, greater public accountability leads to greater pressure to reduce costs, improve efficiency and justify expenditure increases. In comparison to management under city council the utility commission operation is absent from the limelight of major municipal elections and consequently further removed from important political pressures. The elections (or appointments) of commissioners have over the years become dull affairs which go virtually unnoticed by the public and often result in acclamations. Voter apathy regarding water or transit issues develops in both city council and utilities commission elections, but the general desire to control costs at city hall extends to all departments, whereas such pressure seems to be less frequently executed by management of separate commissions. The remuneration rendered to utility commissioners is minimal in most municipalities, and little incentive consequently exists for commissioners to expend much effort in a watchdog role or to acquire any extensive knowledge required for expenditure decisions. Partly for this reason many commissioners tend to slip into the 'rubber stamp syndrome' and allow virtually all policy to stem from a dominant, technically competent manager.

An important source of economies, available to city hall operated commissions, arises from the circular integration of a number of functions. The institutional structure of urban service

provision and changes in the relationship between urban services may be discussed in terms of circular, horizontal, and vertical integration.[26] Circular or complementary integration refers to the relationship between services: the rendering of a number of complementary services by a single unit or plant. Horizontal integration refers to control by government of a number of units all providing a single service; policy towards these units is unified.

Vertical integration refers to control by government of units involved in successive stages of the production service process; water treatment, distribution, and sewage treatment constitute an excellent example.

Complementarity of services at city hall permits certain personnel and facilities to be engaged in multiple functions, creating savings not available to a separate commission. Some of the specific economies due to circular integration are as follows: (1) council-operated utilities may use office space at city hall, whereas utility commissions are generally established in separate buildings; (2) administration under city council provides for the purchase of many services from other departments at city hall (e.g., accounting and legal services), whereas commissions tend to set up their own administrative and operational facilities. Consequently, many departments at city hall can achieve economies of scale, with savings for individual functions; and (3) at city

hall, opportunities exist for pooling capital equipment and labour. Many municipalities succeed in reducing idle hours for capital and labour by transferring them to different functions as need arises. As with many of its departments, city hall can thus achieve economies of scale in the use of men and equipment. This source of savings is more important for smaller than for larger cities, since the smaller-scale operations are much more likely to encounter indivisibilities in capital and labour inputs. Utility commissions, on the other hand, frequently acquire a separate complement of labour and equipment and these inputs are not used, as a rule, for other municipal government functions.

Finally, in view of the standardized and uniform quality levels established for all communities, the cost differential cannot be justified by higher quality of service under a separate commission structure.

In essence, comparative cost differences of a city hall operation versus separate commission provision of a local service appear to depend largely on the financial autonomy or lack of autonomy generated by the service itself. Given that separately run commissions appear to be relatively more costly, one may question the wisdom of establishing a separate 'commission-type' structure for the provision of any local government service. The establishment of these separate commissions, it is alleged, arose from a belief that the separation of the responsibility for

providing certain local services from other local services was essential if these commission services were to be supplied in a technically efficient manner. If left to local councils, local councillors, it is argued, would have insufficient time to handle the workload required to plan, administer and govern all municipal functions. Therefore, the appointment or election of interested citizens to a separate utility commission would allow the community to benefit from citizen involvement and assist in removing part of the workload placed directly on the local council. Furthermore, the policy of appointing rather than electing commissioners has been defended on the grounds that sensitive and highly technical issues should be protected from politics. It can be counter-claimed more legitimately, however, that technical matters can and have been covered by hiring the necessary expertise while sensitive political issues should be placed directly under council control so as to ensure maximum accountability and responsiveness to local residents.

The effect of this proliferation of separate and numerous decision-making bodies at the local level has been to "create a diffuseness of municipal organization that is inevitably more difficult for the citizens to understand, much less to control."[27] With responsibilities divided among separate local bodies, coordination of interrelated activities is difficult and, in many instances, impossible to achieve. All too often, attempts by local councils to undertake particular programs or services are

services are thwarted or made more difficult because of decisions made by utility commissions and other special purpose bodies. For example, a coordinated approach to local council's planning efforts may be complicated by separate actions taken by utility commissions, park boards, conservation authorities, industrial commissions and planning boards.[28]

In summary, it appears that there is little that a separate commission can do that cannot be done by local governments directly. If these responsibilities were transferred to local governments under the governance of local councillors, a considerable step would be taken towards eliminating the current morass of local government institutions and organizations and would allow local councils to set overall priorities by weighing and considering the trade-offs necessary in making decisions on the relative merits of spending on education versus health versus conservation versus local transit, etc. This overall improvement in the allocation of scarce municipal financial resources would produce a council more directly responsible for all municipal functions. As such, it should lead to an improvement in the coordination of all municipal services and functions (at present, the policies of separate commissions sometimes run counter to the policies of local councils) and would assist in the provision of central budgeting control and establish the basis for long-range financial planning. Unfortunately, the present system, where council has no effective or only limited control, often generates

conflicts between commissions seeking to promote their own special interests and the municipality attempting to hold the line on tax rates or restricting expenditures over which it does have substantial control. To overcome these conflicts and to assist in the provision of a better allocation of local resources, local councils must be given sole responsibility for making decisions on the appropriate trade-offs to be made among expenditures on the various programs provided at the local level.

Notes

1 For a listing of most of these studies, see T. E. Borcherding, W. Pommerehne, and F. Schneider, "Comparing the Efficiency of Private and Public Provision: The Evidence from Five Countries," in Nationalokonomie, Journal of Economics, Supplement 2, 1982, by Springer - Verlag, pp. 127-56.

2 Ibid.

3 For a more thorough summary of each of these, see T. E. Borcherding, "Toward a Positive Theory of Public Sector Supply Arrangements," pp. 99-184; and J. Palmer, J. Quinn, and R. Resendes, "A Case Study of Public Enterprise: Gray Coach Lines Ltd.," pp. 369-446 in Crown Corporations in Canada: The Calculus of Instrument Choice, edited by J.R.S. Prichard, Butterworth, 1983.

4 A. Alchian, "Some Economics of Property Rights" (1965), 30 II Politico, 816; A. Alchian and H. Demsetz, "Production, Information Costs and Economic Organization" (1972), 62 American Economic Review, 777; A. Alchian and H. Demsetz, "The Property Rights Paradigm" (1973), 33, Journal of Economic History, 16; and H. Demsetz, "The Exchange and Enforcement of Property Rights" (1964), 7, Journal of Law and Economics, 11.

5 See Palmer, Quinn, and Resendes, op. cit., 1983, pp. 388-91 for a fuller discussion of this.

6 See W. A. Niskanen, Bureaucracy and Representative Government (Chicago: Aldine - Atherton, 1971) for a discussion of the theory and T. E. Borcherding, W. W. Pommerehne, and F. Shneider, op. cit., 1982, pp. 136-43 for a brief listing of the few empirical studies which have been conducted on the public choice model.

7 Borcherding, Pommerehne, and Schneider, op. cit., 1982, p. 137.

8 Ontario is the only province for which municipal data are available on a disaggregated basis.

9 See Borcherding, Pommerehne, and Schneider, op. cit., 1982, pp. 130-33 for a summary of the results of many of these studies.

10 Harry Kitchen, "A Statistical Estimation of an Operating Cost Function for Municipal Refuse Collection" (No. 1, 1976) 4, Public Finance Quarterly, pp. 56-76.

11 For an excellent discussion of the potential and actual shortcomings of municipally run operations, see Dennis Young, How Shall We Collect the Garbage? A Study in Economic Organization (Washington, D.C.: Urban Institute, 1972).

12 Forty-three communities (Metropolitan Toronto is excluded because of the noticeably different nature of the transit service provided, that is, the extensive subway system) provided complete and reliable data and were selected from each of the 1982 and 1983 Ontario Urban Transit Fact Book, a joint publication of the Ontario Ministry of Transportation and Communications, and the Ontario Urban Transit Association, Toronto. Because of some variation in the communities submitting data in each year, a few of the muncipalities in the 1982 survey were replaced by other communities in the 1983 survey.

13 These variables were selected after discussions with municipal and provincial officials regarding the features of urban transit systems which are felt to generate significant cost effects.

14 Population density is measured by dividing population by the number of hectares in each municipality.

15 A weighted index for the price of labour was calculated from both the hourly wage rate for mechanics and operators.

16 To capture the statistical significance of the organizational structure, two dummy variables are used. The first dummy compares the cost of privately contracted transit services (assigned a value of 1) with the cost of provision through a transit commission (assigned a value of 0). The second dummy compares the cost of provision through a municipal department (assigned a value of 1) with the cost of provision through a transit commission (assigned a value of 0).

17 Public provision includes both municipal departments and transit commissions.

18 The cost to the local utility of buying power from Ontario Hydro does not vary depending on geographical location. Instead, it depends on peak (energy) demand in addition to normal demand requirements.

19 Ontario is the only province for which utility data by local utility were available. These data were published in the Ontario Hydro Statistical Yearbook, 1978 and 1982, Ontario Hydro, Toronto, Ontario. The boundaries of these local utilities correspond to municipal boundaries. All rural customers and more than 100 large industrial customers are serviced directly by Ontario Hydro and hence, are excluded from the data in this study.

20 This was found to be quite significant in one U.S. study dealing with transmission and distribution costs of municipal utilities, L. W. Weiss, "Anti Trust in the Electric Power Industry," in Promoting Competition in Regulated Markets, A. Phillips, editor, The Brookings Institution, Washington, D.C., 1975, pp. 144-46.

21 Harry M. Kitchen, "A Statistical Estimation of an Operating Cost Function for Municipal Water Provision," Urban Analysis, 1977, Vol. 4, pp. 119-33.

22 Harry M. Kitchen, "A Statistical Estimation of an Operating Cost Function for Municipal Refuse Collection," Public Finance Quarterly, Vol. 4, No. 1, January 1976, pp.56-76.

23 Harry M. Kitchen, 1977, op. cit.

24 Ibid.

25 For a more detailed discussion of why this cost differential exists, particularly as it applies to water provision, see Harry Kitchen, "Some Organizational Implications of Providing an Urban Service: The Case of Water," Canadian Public Administration, Summer 1975, pp. 297-308.

26 Hirsch is one of the forerunners in developing a theory of urban service integration; see W. Z. Hirsch, 'Expenditure implications of metropolitan growth and consolidation,' Review of Economics and Statistics, 41, 1959, pp. 232-41.

27 Thomas J. Plunkett, Urban Canada and Its Government: A Study of Municipal Organization, MacMillan, Toronto, 1968, p. 60.

28 For a listing of potential conflicts between local councils and special boards and commissions, see C. R. Tindal and S. Nobes Tindal, Local Government in Canada, McGraw-Hill Ryerson, Toronto, 1979, Ch. 5.

5 SUMMARY AND CONCLUSION

Most of the local government business enterprises are located in the province of Ontario. At the same time, the bulk of these enterprises are concentrated in the electric power industry.

Although the rationale for establishing local government enterprises has varied, historically many of them were started as separate local government enterprises so as to avoid the alleged harmful political ramifications arising from local council operations. In this fashion, it was argued that a more technically competent and carefully administered service would ensue. While the actual achievement of superior administration and a higher degree of technical competence may be debatable, these enterprises appear not to have followed and still do not follow an economically efficient pricing policy in charging consumers for their respective services. In essence, an efficient pricing policy suggests that prices should be set to cover the marginal cost of providing the last unit of service, unless, of course, there are economically sound reasons (such as the existence of externalities or because of distortion existing elsewhere) for deviating from this policy.

The pricing policy adopted by local government enterprises consists of a number of schemes. These range from fixed charges that are unrelated to the volume of service consumed to charges that vary directly with the quantity of service consumed. In between lies a mixture of both fixed and variable charges. In addition, revenue from these charges covers somewhere between all and a very small percentage of all operating costs. The decision as to the pricing structure adopted by each separate enterprise seems to depend on a combination of diverse factors including local tradition, the nature of the service supplied, the preferences of the local residents, the desire of local politicians and administrators to utilize charges as opposed to local tax dollars, and the institutional and legal constraints within which each local government enterprise must operate.

In this paper, an attempt has been made to evaluate the pricing behaviour of three separate local government enterprises in the province of Ontario. The three services chosen (water, electric power and urban transit) operate in different institutional and legal environments.

Water provision, regardless of whether it is under the direct responsibility of local council or a separate utility commission, faces no controls or restrictions over the format of the rate structure employed. Either flat rate or metered charges or a combination of both cover the bulk of all operating costs.

Extending or renovating the waterworks system or expanding the capacity is generally financed from special charges or levies and/or provincial and federal grants. Any remaining deficit is absorbed through the application of a general mill rate on assessed property values. Finally, while variation (city hall versus separate commission) does exist in the organization responsible for providing water, the variation in rate structure (that is, flat rate versus meter) is not associated with one type of organization versus the other. Variation in pricing policies exists under each organizational mode.

By contrast, the local provision of electric power is tightly regulated and controlled by Ontario Hydro. All applications for rate increases and plant repairs or expansion must be approved by Ontario Hydro. The provision of electricity in each municipality is governed by a separate electric utility commission; however, in some communities, the commissioners are elected while in other communities, they are appointed. While all local electric utilities follow a declining block rate pricing structure, the difference in the level of rates charged across municipalities is closely correlated with differences in cost and not associated with whether commissioners are appointed or elected.

The third local service reviewed, specifically the provision of urban transit displays the greatest variation in the type of organizational structure governing its provision. Local transit

is provided under four organizational modes. These include provision through a local department directly under local council; provision by a private supplier who is contracted by the municipality to provide urban transit services; provision through a separate local utility commission; and provision through the public utility commission which also supplies electricity and water. As well, it is distinguished from water and electricity because of the large operating deficit and capital subsidies received from the provincial government. However, unlike the local provision of electric power, but similar to the provision of municipal water, no provincial controls are exerted over the rate structure (prices charged to different types of users -- adults, children, senior citizens, etc.) or its absolute level. On the other hand, local council appears to have more control over the provision of this service than water because local councils must approve annual transit budgets before subsidizing their operation. Once again, variation in the rate structure is closely associated with differences in costs and not with the organization responsible for supplying the service.

A comparison of the relative efficiency or inefficiency of providing local government services is potentially the most interesting and illuminating result of this paper. The empirical investigation suggests that over 72 and 74 per cent of the per capita variation in urban transit operating expenditures in Ontario municipalities could be explained in 1982 and 1983

respectively. While all of the independent variables produced the expected effects, two, in particular, are of interest in this paper. First, privately contracted (by the municipality) provision of urban transit services is significant less costly than publicly provided provision (significant at the .005 level). Second, although the statistical significance is lower (.15 level), provision through a department operated by city hall tends to be less costly than provision through a separate transit commission. This latter conclusion has also been reached in an earlier study on residential water provision in Canada. In reality, the lower costs of city hall versus a separate commission operation has been attributed to greater pressure towards public accountability and an ability to benefit from circular integration with the other functions performed by city hall.

The more costly provision by a public operation (city hall or separate commission) vis-ă-vis a private contractor has been attributed to a lack of competition and hence, an inability or lack of desire to improve upon technical efficiency and performance in the government sector.

Finally, an assessment of electric utility operating costs suggests that, wherever possible, local electric utilities should consider the possibility of contracting out, either to the private sector or to larger neighbouring utilities, their repair and

maintenance functions. This has proven to be statistically significant as a cost saving device in the past.

While the results of this paper suggest considerable variation in the pricing of urban services, the pricing structures and policies employed cannot be closely identified with the types of organizations currently providing local government services. Indeed, the pricing policies appear to have been established to cover a preset proportion of all operating costs. Unfortunately, the prices charged tend not to be set to correspond to the marginal cost pricing principle. Although there may be reasons, practical or otherwise, why this principle is not followed, distinct improvements in efficiency could be achieved if closer adherence to this principle became a local government objective.

Not only could improvements in pricing policies be achieved, but improvements in the relative efficiency of providing local services could also be obtained from altering the organizational structure for providing certain services in some communities. What is needed is a careful reassessment of each existing local government enterprise responsible for providing local services. This might involve a detailed case study of a few services in selected municipalities. While such a study might be time consuming, it would undoubtedly generate cost savings and provide some organizational insights which would improve the efficiency of providing local government services.